TM 11-447

WAR DEPARTMENT

TECHNICAL MANUAL

Keyer TG-10-J (Automatic, 60 Cycles)

and Keyers TG-10-A, TG-10-B, TG-10-C, TG-10-D, TG-10-F

May 15, 1943

WAR DEPARTMENT
Washington, May 15, 1943

This Technical Manual, published by Gray Mfg. Co. on Order No. 21684-Phila-43, is furnished for the information and guidance of all concerned.

This manual covers Keyer TG-10-J but, because of the basic similarity between Keyers TG-10-J and Keyers TG-10-A, TG-10-B, TG-10-C, TG-10-D, TG-10-F, references to the equipment throughout this manual include an asterisk within parenthesis instead of the suffix letter.

Circuit diagrams for these equipments are included in Section V "Supplementary Data" covering the differences in circuit between the different keyers. Differences in purely mechanical detail will be covered by changes to be printed and issued.

TECHNICAL MANUAL
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KEYER TG-10-(*)
(AUTOMATIC, 60 CYCLES)

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DESTRUCTION OF ABANDONED MATERIAL IN THE COMBAT ZONE

In case it should become necessary to prevent the capture of this equipment, and when ordered to do so, DESTROY IT SO THAT NO PART OF IT CAN BE SALVAGED, RECOGNIZED OR USED BY THE ENEMY. BURN ALL PAPERS AND BOOKS. By:

1. Explosives, when provided.
2. Hammers, axes, sledges, or whatever heavy objects are readily available.
3. Burning with gasoline, oil, paper, or wood.
4. Grenades and shots from available arms.

PROCEDURE:

1. Obliterate all identifying marks. Destroy nameplates and circuit labels.
2. Destroy all controls, switches, relays, connecting means and meters.
3. Rip out all wiring in electrical equipment.
4. Smash every electrical or mechanical part whether rotating, moving or fixed.
5. Break up all operating instruments such as keys, phones, microphones, etc.
6. Destroy all classes of carrying cases, straps, containers, etc.

DISPOSAL:

1. Where possible, and time permits bury all debris or dispose of it in streams or other bodies of water.

SAFETY NOTICE

DANGEROUSLY HIGH VOLTAGES ARE PRESENT IN THIS EQUIPMENT. BEFORE MAKING ANY ATTEMPT TO ADJUST OR REPAIR THIS INSTRUMENT DISCONNECT IT FROM THE POWER SOURCE.

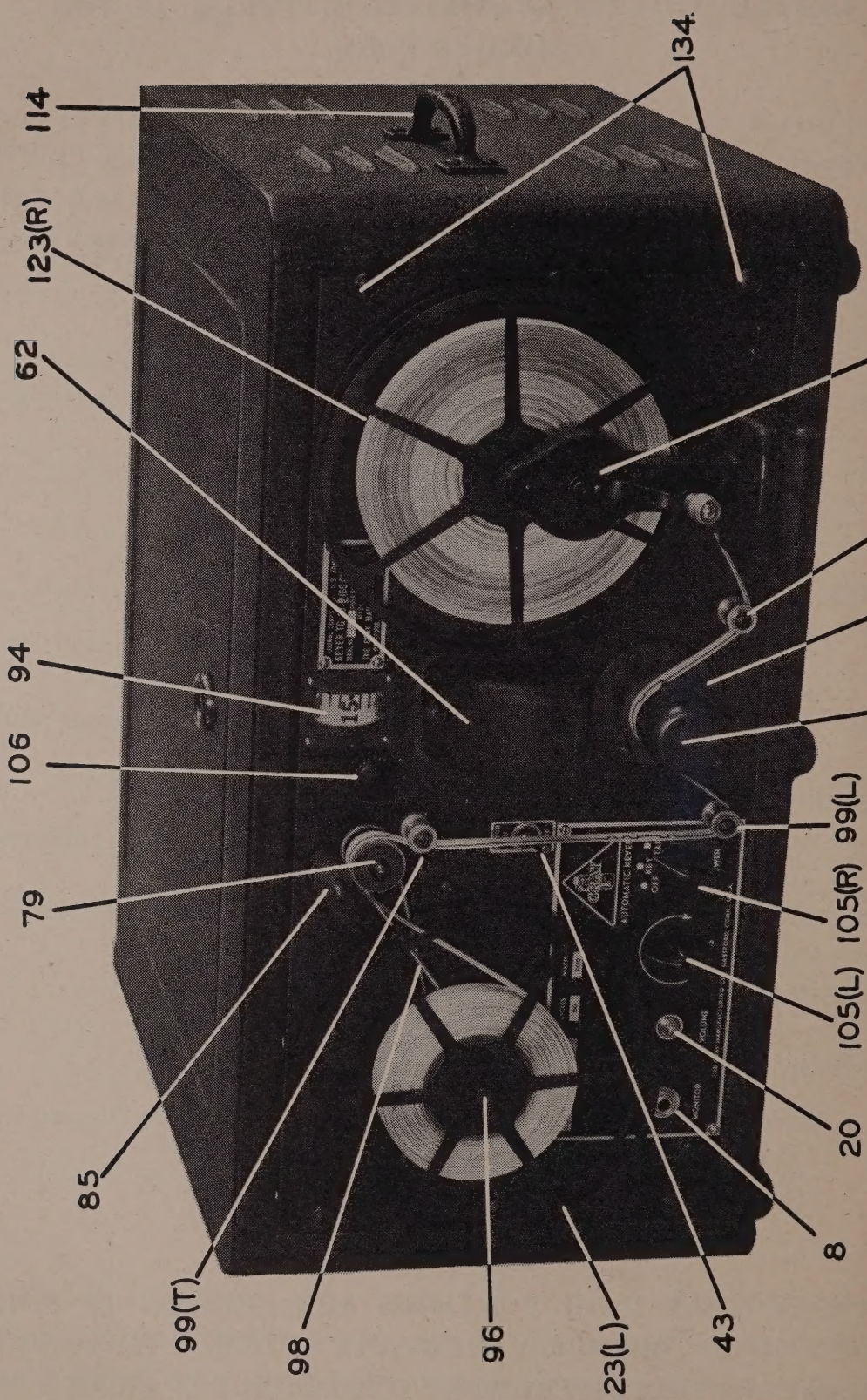

Figure 1. Keyer TG-10-J (Automatic, 60 Cycle), Front View

SECTION I—DESCRIPTION

1. General.—Keyer TG-10-(*) is an automatic unit for providing audible code practice signals from an inked tape recording. The output of the keyer is an audio frequency note of 800 cycles per second with sufficient power to supply a number of headsets or practice tables directly. The keyer is a self-contained unit requiring only connection to the power mains, and to the headsets, directly or through practice tables.

2. List of Components.—*a. Cabinet Mounting.*—Keyer TG-10-(*) is mounted in a cabinet as illustrated in Figure 1.

		Maximum Overall Dimensions Including Projections			
Quantity	*Name of Part*	*H*	*W*	*D*	*Weight*
1	Keyer TG-10-(*)	11″	24″	18½″	63 lbs.

1 Set Vacuum Tubes consisting of:

Signal Corps Tube	*Commercial Type*
2 Tubes VT-96	RMA 6N7
2 Tubes VT-115	RMA 6L6
2 Tubes VT-116	RMA 6SJ7
1 Tube VT-244	RMA 5U4-G
1 Tube VT-252	RCA 923

2 Tapes, inked paper

3 Reels, take-up

Note: Accessories required are, a pair of monitoring headphones, and an external key.

b. Rack Mounting.—Removed from the cabinet, the keyer fits a standard 19″ relay rack. The height of the panel is 8¾″. Keyer TG-10-(*), less cabinet, weighs 40 pounds.

3. Power Supply.—Keyer TG-10-(*) operates only on 115-volt, 60-cycle alternating current. A voltage variation within the range 95-120 volts will not substantially affect the operation of the instrument.

4. Alternative Use.—*a. External Keying.*—Keyer TG-10-(*) may be operated by an external telegraph key, either manual or automatic.

Under these conditions, the tape mechanism is not used, but the same amount of audio signal power is still available for the headsets.

b. Tape Pulling for Ink Recorder.—Keyer TG-10-(*) is arranged with suitable recessed guide rollers and pressure roller, which may be used with any one of several types of ink recorders where the latter is not provided with its own tape pulling mechanism. (See paragraph *8d.*)

SECTION II

Installation and Operation

5. Initial Procedure.—*a. Unpacking.*—(1) The unit is packed in an individual carton. First open the carton at the TOP and carefully remove the fitted cardboard blocking pieces from the front and sides. Now lift the cabinet from the carton.

(2) A set of vacuum tubes (exclusive of the photo-electric cell and exciter lamp) is in a separate cardboard container issued with the keyer and marked "Tube Set for Keyer TG-10-(*)." Inside this larger carton are seven vacuum tubes, each separately packed and marked with its tube number. A list of these tubes is given in paragraph 2a. After the tubes have been unpacked, insert them in the proper sockets as marked on the chassis.

6. Installation.—*a. Selection of Output.*—Three output impedances are provided at the output terminal board (35) on the rear of the chassis. Either 4, 8 or 15 ohms may be selected by connecting between the common terminal and the one appropriately marked. The most suitable matching impedance may be selected by taking into account the average number of headphones to be connected to the keyer and the impedance of each.

b. Wiring.—(1) Table Mounting.—If the keyer is to be operated from a table or bench, first place it in position and then run a pair of leads from the output terminals (35) to the distributing board. Plug the power cord into its receptacle (11) on the rear of the chassis, and into a convenient power outlet.

(2) Rack Mounting.—If several keyers are to be mounted together on a standard relay rack, remove the unit from the cabinet by first removing the six screws (134) on the ends of the panel, and then the

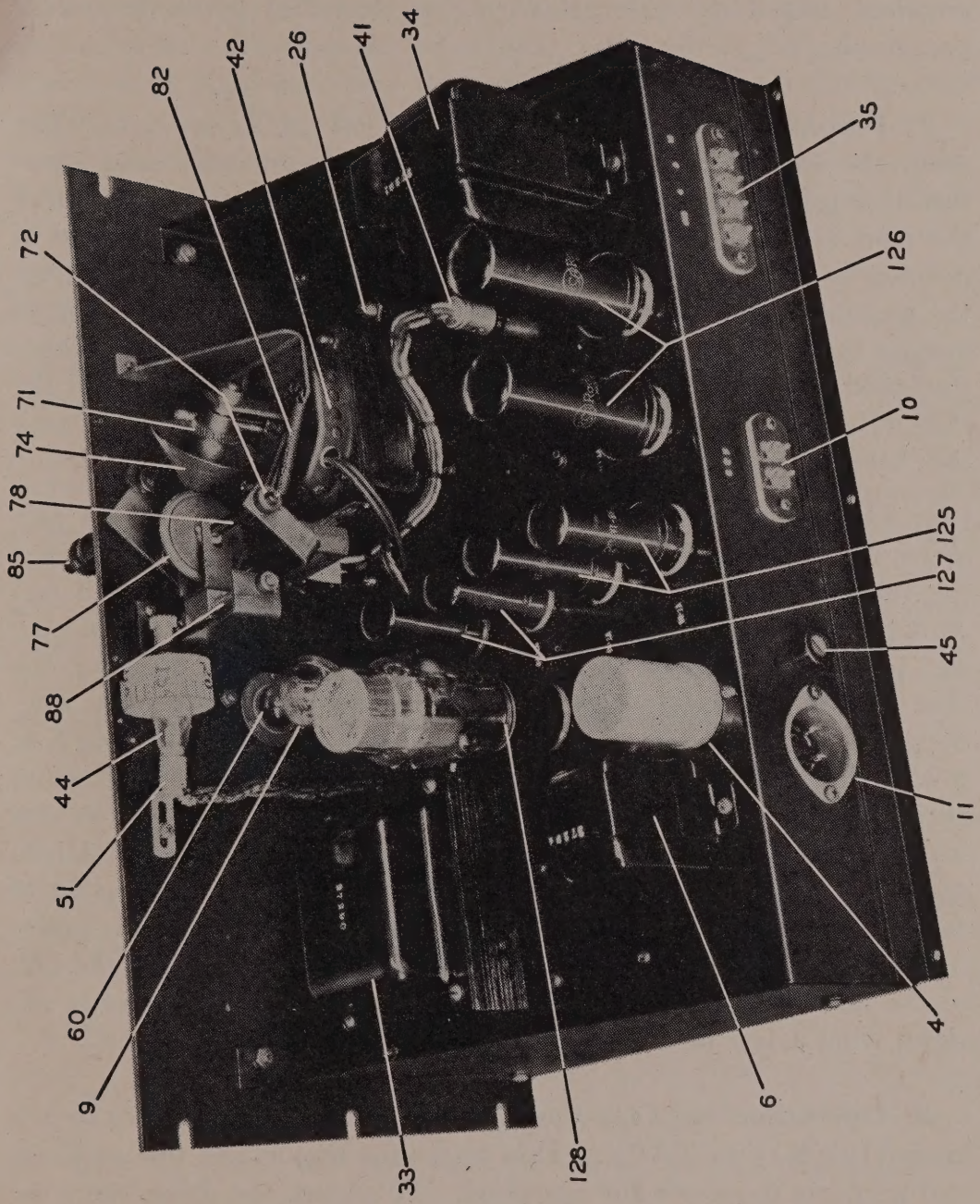

Figure 2. Keyer TG-10-J (Automatic, 60 Cycle)

three screws holding the rear of the chassis to the bottom of the cabinet. The panel and chassis are rigidly fastened so that the keyer can be mounted, using the same panel screws, to the relay rack. When so mounted, install the external wiring as described in the preceding paragraph.

7. Preparation for Use.—*a. Adjustment of Light Gate.*—The removable cover (59) (inclosing the phototube) contains a small aperture through which light passes. The position of this aperture, under the tape, is adjusted by sliding the cover in or out, and locking it in position by means of the knurled nut (165) underneath it. To adjust the position of this aperture fold the tape at a point corresponding to a space between dots and dashes, which as a rule, is at the point where the inked line is off the center of the tape. By placing the end of the tape adjacent to the light aperture the cover can be manipulated until this hole is opposite the middle of the inked line.

b. Threading.—When the rewind mechanism (103) is pulled forward, it will swing on hinges away from the panel far enough so that the full reel of tape (123(R)) may be inserted. Wind the full reel so that the inked side of the tape faces the hub of the reel. Hold the reel so that with the square driving hole in it facing the operator, the free end of the tape is suspended at the operator's right hand side. Snap the reel in place over the ball catch, with the square driving hole toward the crank, and return the rewind mechanism to its original position with the reel vertical. Move the pressure roller (85) so that it is disengaged from the puller roller (79) and pass the tape, ink side up, under guide roller (99(R)), over the light gate (59), under guide roller (99(L)) to the left of guide roller (99(T)) and over the puller roller (79). Insert the end of the tape in one of the slots in the hub of the take-up reel (123(L)) and, turning the wheel by hand to the right, wind a few layers of tape on it.

8. Operation.—*a. Tape Keying* (1) *Start.* Turn the rotary switch knob (105(R)) to TAPE. This starts the motor and the amplifier and prepares the keyer for operation. To engage the drive lower the pressure roller (85). This will force the tape against the puller (79), and the keyer will reproduce the signal recorded on the tape.

(2) *Bias.*—With the tape running, a pair of earphones plugged into the MONITOR jack (8), and with the BIAS knob (105(L)) (on the front panel) vertical, rotate the bias control (26) (located on the

chassis to the left of motor (42)) by means of a screw driver until a clear signal is heard. If the control is turned too far to the left, no signal will be heard, while if it is turned too far to the right a steady signal will result. The correct position is somewhere between these two extremes, although the adjustment need not be critical. If the bias control requires a very close setting, recheck the adjustment of the light gate. Since the line voltage supplying the keyer changes, it may be necessary to *reset* the bias control, although this is not necessary for ordinary variations. The BIAS knob (105(L)) (on the front panel) provides a fine adjustment of the bias, and is used in normal operation of the keyer, after the bias control (26) on the chassis has been properly adjusted.

(3) *Volume.*—The volume of the signal delivered to the practice tables may be varied by the screw driver adjustment (20) marked VOLUME. Rotation to the right increases the volume.

(4) *Tape Speed.*—The speed control knob (106) (located in the upper center of the front panel and immediately to the left of the tape speed indicator (94) controls the rate of speed of the tape, and therefore (for any given tape), the speed of the transmission. Before turning the speed control knob (106) disengage the tape feed by lifting the pressure roller (85). The indicator dial (94) is calibrated in feet per minute to indicate the linear speed of the tape.

(5) *Motor Switch.*—When using the keyer as a tape puller with a separate inker, to turn on the motor regardless of the position of the rotary switch knob (105(R)) throw Switch (43). (See paragraph 7d.)

b. Rewinding.—To return the tape to the magazine reel (123(R)),

(1) Disengage the drive by moving the pressure roller (85) upward and away from the puller roller (79).

(2) Remove the tape from the puller roller so that it feeds from the reel (123(L)) to the guide roller (99(L)) under the photo-tube housing and directly to the guide roller (99(R)).

(3) To return the tape turn the handle of the rewind to the right.

c. External Keying.—To transmit the signal of a manually operated key to the practice tables, turn the rotary switch knob (105(R)) to KEY (connected to the KEY terminals (10) on the rear of the chassis). With manual keying the bias control is out of service but the volume control functions exactly as it does with tape keying.

d. Tape Pulling for Ink Recorder.—To operate the puller mechanism with a separate inker, first locate the inker to the right of the keyer, and then thread the tape under the guide roller (99(R)), under the photo-tube housing, under the guide roller (99(L)), to the left of the guide roller (99(T)) and over the puller roller (79). To do this, first remove the magazine reel (123(R)). The rollers coming into contact with the top, or inked side of the tape, have their centers recessed so they will not smear freshly inked characters. It is customary to allow the tape to fall at random into a basket on the floor. When using the keyer in conjunction with an ink recorder, turn the motor switch (43) ON so that the motor is operated independently of the rotary switch, which is operated by knob (105(R)). If the ink recorder requires the use of an oscillator to actuate the ink stylus, turn the rotary switch knob (105(R)) to KEY, connect a manually operated key to the KEY terminals (10) and connect the ink recorder signal input terminals to the output terminals of the keyer (35).

9. Precautions During Operation.—*a. Pressure Roller.*—When the keyer is not in use, set the pressure roller (79) UP with the feed disengaged, to avoid damaging the drive roller (77).

10. Adjustment for Field Upkeep.—*a. Tubes.*—A possible source of trouble is a defective tube. Check all tubes every 500 hours of operation. (See paragraph 13f.)

b. Photo-Electric Cell.—Should it become necessary to replace the photo-electric cell see paragraph 13g.

c. Exciter Lamp.—The exciter lamp (9) contains two filaments, only one of which is used at a time. If the lamp fails to light when the rotary switch is at TAPE, see paragraph 13h.

d. Fuse.—The keyer is shipped with a fuse in place in its holder (45) on the rear of the chassis. If the keyer fails to operate when turned on check the fuse. See paragraph 13i.

SECTION III—FUNCTIONING OF PARTS

11. Power Switch.—The power switch (31) is a three-position rotating switch with the positions marked OFF, KEY, and TAPE. At OFF, with the possible exception of the puller motor (42), the entire apparatus is dead. The puller motor (42) is turned ON and OFF independently by means of motor switch (43) for use as a tape puller. At KEY, the oscillator-amplifier section is turned on and the hand

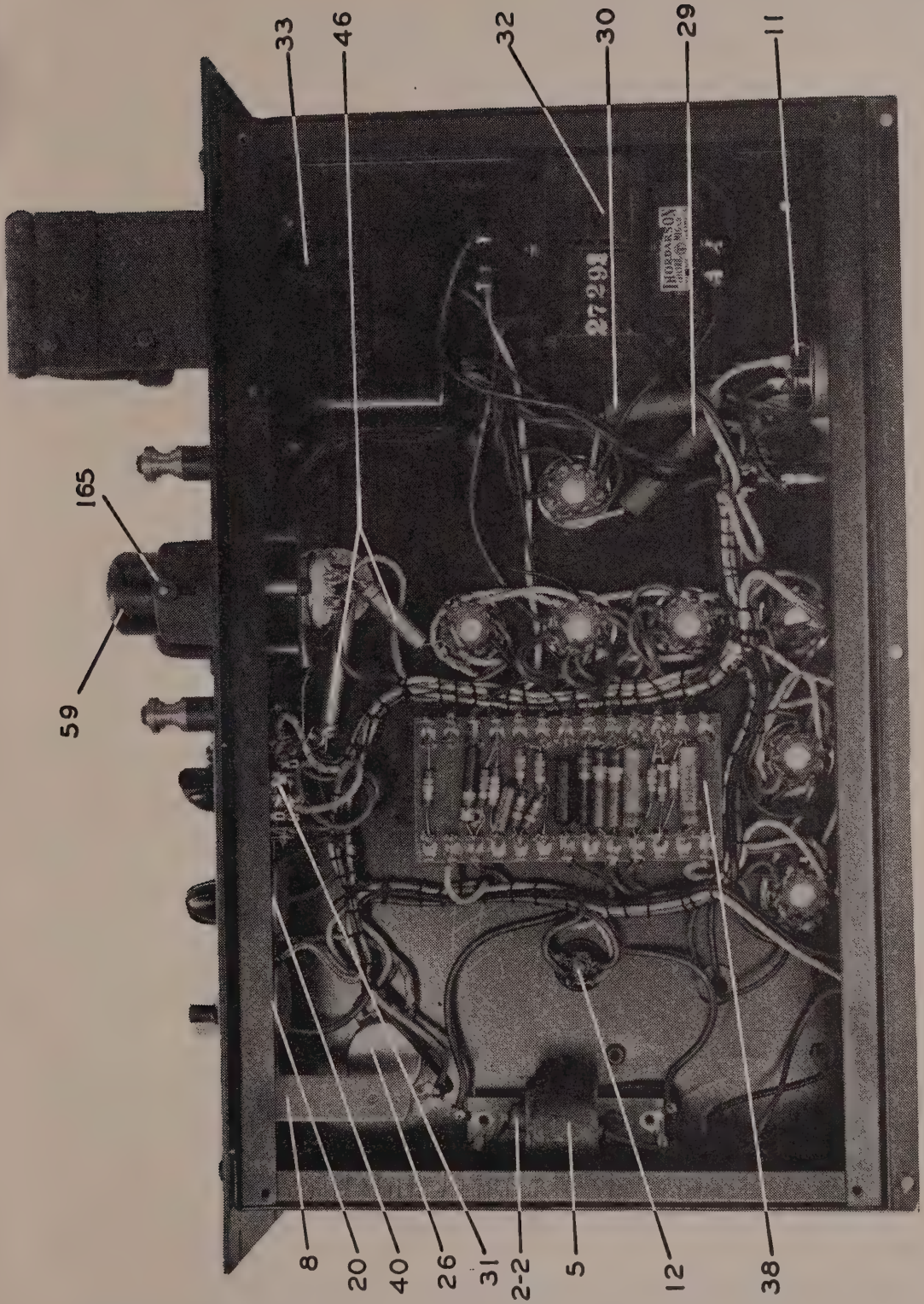

Figure 3. Keyer TG-10-J (Automatic, 60 Cycle) Chassis Underside

key controls the tone output; both the puller motor (42) and the exciter lamp (9) are inoperative. At TAPE, the motor and the lamp are turned on, in addition to the oscillator-amplifier, and the unit functions as a full automatic tape keyer.

12. Amplifier.—*a.* When the main switch is set at TAPE, light falling on Tube VT-252 (photo-tube (1)) causes the current to flow through its plate resistors, making the voltage positive at the upper end of resistor (13-1), and negative at the lower end of resistor (13-2). The voltage across the bias controls developed by the rectifier bleeder current causes a positive potential at the cathode of Tube VT-116 (2) with respect to the lower end of resistor (13-2). From the cathode of tube (2) to its grid, the bias voltage is from plus to minus, and the photo-tube load voltage is from minus to plus. These two voltages are in opposition; and the difference furnishes the trigger voltage, so that with a greater light intensity, the grid voltage is more positive with respect to the cathode, and with less light intensity, it is more negative.

b. Resistor (15-1) is the plate-load for Tube VT-116 (2) as well as the grid resistor for tube (3). This tube, and Tube VT-116 (3) form a two-stage d-c amplifier. As the grid of tube (2) goes sufficiently negative there will be no plate current in tube (2) and no voltage across its plate load. Tube (3) will then have no grid bias. When the grid bias of tube (2) becomes zero (or positive with respect to its cathode), plate current flows through its plate load resistor (15-1). Tube (3) will then have a high negative bias.

c. As in the case of tube (2), when the grid of tube (3) becomes sufficiently negative, tube VT-96 (4) will have no bias. When the grid voltage on tube (3) approaches zero, tube (4) will have a high negative bias, and the plate current in one section will be cut off. When the grid voltage approaches zero, the plate current of tube (3) will cause a voltage to be developed across resistor (16) in such a direction that the upper end will be negative with respect to the lower end, which is connected to resistor (39). This voltage is impressed directly across the grid and cathode of the left-hand section of tube (4) and acts as the control voltage for this tube.

d. Tube VT-96 (4) is a double-triode functioning as a tone oscillator (of the multi-vibrator type) at a frequency of approximately 800 cycles. This frequency is determined mainly by the values of the tank circuit made up by inductor (5) and capacitor (2-2). The feedback circuit, composed of capacitor (1) and resistor (17) also has

some effect on the frequency. Any small voltage variation in the plate circuit of the right-hand section of tube (4) is fed to the grid of the left-hand section through capacitor (1) and resistor (17). This is amplified by the left-hand section and fed back to the grid circuit of the right-hand section through the capacitor (2-1). Thus, energy is fed from each section of the tube to the other section in the proper phase and oscillation takes place. In order to keep the wave shape of the signal from squaring, it is necessary to prevent too great a flow of voltage back to the grids. To do this, the plate loads of each section are center tapped at the junction of resistors (19-1) and (19-3) and resistors (19-2) and (19-4). The a-c returns to the grids are brought to these junction points.

e. When the light source and tape reduce the left-hand grid voltage of tube (4) to zero, oscillation takes place. No light on tube (1) causes the grid voltage of tube (4) to be highly negative which results in the plate current being cut off through the left-hand section of tube (4) so that there can be no oscillation.

f. When the main control switch is thrown to KEY, the grid of tube (3) is connected to ground through the key. When the key is open, the grid voltage of tube (3) is zero, and the oscillator is inoperative. When the key is pressed, connecting the grid of tube (3) to ground, a high negative voltage appears on its grid, and the tube (4) oscillates.

g. The 800 cycle voltage developed across the tank circuit is fed across resistor (20), the volume control. This voltage is impressed on the grid of the left-hand section of the double-triode, phase-inverter Tube VT-96 (5). The signal voltage is then amplified and appears across the plate load resistor (22-2); then, through its coupling capacitor, is impressed on the grid of Tube VT-115 (7). At the same time, the grid resistor for tube (7) acts as a voltage divider. The portion of the voltage developed across resistor (23) is fed to the right-hand grid of Tube VT-96 (5). The output from this half of Tube VT-96 (5) is fed to the grid of Tube VT-115 (6). This produces the necessary 180 degrees phase difference between the signals appearing on the grid of tube (6) and tube (7), and the voltage divider is properly proportioned to make these voltages equal in value. Resistors (36-1) and (36-2) in series with the control grid of Tubes VT-115 (6) and (7) serve the purpose of high frequency chokes to prevent parasitic oscillations when glass tubes are used to replace metal tubes in the keyer.

h. The output voltage from tubes (6) and (7) appears across transformer (34). The low impedance side of this transformer has a resistor connected across the 15-ohm output winding in order to keep the tube load from rising too high when external loads are removed from the keyer.

i. The rectifier circuit of Tube VT-244 (8) has a resistor (29) connected in series with the load and serves to limit the peak and surge currents to capacitor section (4-3). Resistor (30) is connected in series with inductor (6) in order to provide the proper voltage for the screen grids of the output tubes (6) and (7).

SECTION IV—MAINTENANCE

13. Servicing.—*a. Lens and Mirror System.*—

(1) Clean the exposed side of each lens (60) occasionally with a soft cloth or cleansing tissue.

(2) At least once a year remove the mirror housing casting (62) and also clean the mirror lens.

(3) Remove the photo-tube cover (59) occasionally and clean the light aperture carefully with a piece of fine wire to remove any accumulation of grit or lint.

The position of the lens and mirror housing is adjustable to permit positioning the light beam on the small aperture in the photo-tube cover. By turning the lower screw (141), which is provided with a spring tension holding arrangement, the housing may be moved away from, or brought closer to the panel. Lateral adjustment of the lens and mirror housing is obtained by loosening the upper screw (142), moving the housing to the desired position and retightening the screw.

b. Drive Cone and Roller.—A supply of neoprene rings (77) is included in the spare parts kit. To make replacement:

(1) Release the set screw in the puller shaft retaining collar (72).

(2) Remove the puller shaft retaining collar (72) as follows: Grasp the tape puller roller (79) and pull the shaft forward. This releases the cone driven roller assembly, which is keyed to the shaft.

(3) To remove and replace the neoprene ring, first remove the nut and outer washer of the cone driven roller assembly.

(4) In re-assembling, be sure to set up the retaining collar (72) so that excess end-play of the puller shaft is prevented; but be sure that this adjustment is not tight enough as to cause binding.

(5) About once a month clean the neoprene ring (77) and the driving cone (74) with benzine and a soft cloth to remove any oily film which may have accumulated. **Don't use abrasives, such as sandpaper, on the driving cone.**

c. Puller Roller.—A supply of puller rollers (79) is included in the spare parts group. To replace the rubber portion, remove the acorn nut on the front of the roller and take off the outer washer. Now remove the rubber puller and install a new one.

d. Transformers.—One spare transformer of each type required by Keyer TG-10-J is included in the spare parts group.

e. Amplifier.—Figure 4 is a circuit diagram of the amplifier and oscillator. The same diagram is attached to the bottom plate of the chassis. Paragraphs 15, 16, and 17 give the necessary information for checking and servicing the amplifier.

f. Tubes.—As indicated in paragraph 15, a defective or burned out tube may be a source of trouble. The tubes in the keyer may be checked in a standard tube tester.

g. Photo-Electric Cell.—To replace the photo-electric cell (129), first loosen the knurled nut (165) under the protruding housing and remove the housing cover (59).

h. Exciter Lamp.—The exciter lamp (9) contains two filaments. To change from one filament to the other, first remove the bulb from its socket and then reinsert it after turning it through 180 degrees. This will connect the spare filament. If both filaments are burned out, replace the bulb. If no spare exciter lamps are available, replace it with a standard 32-32 candle power, No. 1000 automobile headlight bulb. To adjust the focus of the light beam, loosen the two screws holding the socket of the exciter lamp (9), move the lamp and socket to the optimum position and re-tighten the two screws.

i. Fuse.—To check the fuse (7) located at the rear of the chassis, unscrew the red portion of the fuse holder (45) with a screw driver. The fuse will come out with the screw cap. If it is defective, insert a

14. Lubrication

Reference Number	*Points of Lubrication*	*Lubricant to Be Employed*	*Quantity of Lubricant*	*Service Periods*	*Special Instruction*
42	Motor Bearings	SAE 20 or heavy mineral oil	as required	1000 hours operation or at 3 month intervals	Remove motor assembly and saturate felt oil retainers
71	Helical Gear on Motor Assembly	white petroleum jelly	as required	1000 hours operation or at 3 month intervals	
75 & 79	Cone Shaft and Tape Puller Bearings	SAE 20 or heavy mineral oil	one drop	1000 hours operation or at 3 month intervals	
78	Splined section of Tape Puller Shaft	white petroleum jelly	as required	2000 hours operation or at 6 month intervals	
88	Speed Control Feed Screw	white petroleum jelly	as required	2000 hours operation or at 6 month intervals	
92	Indicator Dial Shaft Bearing	SAE 20 or heavy mineral oil	one drop	2000 hours	
96	Take-up Reel Shaft	SAE 10 or light mineral oil	as required	500 hours or at 1 month intervals	Disassemble and clean bearing surfaces every 2000 hours
85	Pressure Roller	SAE 10 or light mineral oil	as required	500 hours or at 1 month intervals	Disassemble and clean bearing surfaces every 2000 hours
99	Tape Guide Rollers	SAE 10 or light mineral oil	as required	500 hours or at 1 month intervals	Disassemble and clean bearing surfaces every 2000 hours
103	Rewind	SAE 10 or light mineral oil	as required	500 hours or at 1 month intervals	

new one. If fuses are not available from spare stock, the keyer may be fused with a standard 3AG automotive fuse having a rating of 3 amperes at 250 volts.

15. Trouble Location Chart.—*a. Tape Position.*—Symptoms 1, 2, and 3 apply when the amplifier, exciter lamp, or motor are completely dead. If the amplifier is apparently "ON" and the exciter lamp and motor operate, but no signal is received from the keyer, look for the remaining symptoms from 4 to 14, inclusive. Tube VT-224 (8) will light, and some heat will be radiated by the other tubes, especially Tubes VT-115 (6 and 7), if the amplifier is drawing power, even though it is not working properly.

TAPE POSITION

Symptom	*Cause*
(1) Amplifier dead, exciter lamp off, motor not running.	No a-c line voltage. Open power lead. Poor plug contact (11). Burned-out fuse (7). Defective power switch (31). Loose connection from power receptacle (11) to fuse (7) to switch (31) to transformers (32) and (33) and receptacle (12).
(2) Exciter lamp not lighted, motor runs, amplifier on.	Burned out exciter lamp (9). Loose connection or defective lamp socket (9). Defective power switch (31). Loose connection on power switch (31). Defective exciter lamp transformer (32). Loose connection from power switch (31) to transformer (32) to lamp socket (9).
(3) Motor dead, exciter lamp and amplifier on.	Defective power switch (31) Defective motor receptacle (12) or plug (41). Loose connection from power switch (31) to motor receptacle (12). Loose connection from motor plug (41) to switch (43) to motor (42). Defective motor (42).

b. Key Position—Key Terminals Shorted.—For check of the operation of the amplifier alone, it is easier to start with the switch set at KEY position, since this narrows the preliminary search to the oscillator and power amplifier. These components are common to both "KEY" and "TAPE" operation. Test all tubes on a standard tube checker before starting on a circuit analysis.

KEY POSITION—KEY TERMINALS SHORTED

Symptom	*Cause*
(4) No filament voltage.	Defective power transformer (33). Loose connection from power transformer (33) to tube sockets. Burned-out tube filament.
(5) No plate or screen voltage on tubes 6 & 7.	Burned-out rectifier tube. Open resistor (29) or (30). Open filter choke (6). Shorted filter capacitor (4-3) or (4-4). Loose connection or open lead from rectifier tube 8 to resistor (29) to filter choke (6) to resistor (30) to output transformer (34) to sockets of tubes 6 & 7. Open output transformer (34).
(6) High plate and screen voltage tubes 6 & 7.	Open resistor (24). Open lead or loose connection from resistor (24) to tube socket.
(7) Low plate and screen voltage tubes 6 & 7.	Shorted resistor (24) Shorted capacitor (4-2). Shorted grid resistor (15-2) or (15-3). Shorted coupling capacitor (3-2) or (3-3). Open lead or loose connection from resistor (15-2) to (15-3) to tube socket or ground.
(8) Low or no plate voltage tube 5.	Defective or open resistor (22-1) or (22-2). Defective or open resistor (23). Defective resistor (21). Loose connection or open lead from resistor (20), (22-1) or (22-2) to tube socket.

Symptom	*Cause*
(9) High plate voltage tube 5.	Open resistor (21). Loose connection or open lead from resistor (21) to tube socket or ground.
(10) Low or no plate voltage tube 4.	Defective or open resistor (19-1), (19-2), (19-3), or (19-4). Defective resistor (28).
(11) High plate voltage tube 4.	Open resistor (18). Loose connection or open lead from resistor (18) to tube socket or ground.
(12) No audio frequency output.	Headset plug not completely inserted in jack (8). Defective headset, headset plug, or headset cord. Loose connections from transformer (34) or jack (8) to terminal strip (35). Defective secondary on output transformer (34). Shorted external leads from terminal strip (35). Damaged capacitor (2-2), (1), or (3-1). Defective or damaged resistor (16) or (17). Defective or damaged oscillator choke (5).
(13) A-c ripple in output.	Defective filter choke (6). Defective filter capacitor (4-3), (4-4), (4-2), or (4-1).
(14) Low audio frequency output.	Defective tube 4, 5, 6, or 7. Defective output transformer (34). Shorted external leads from terminal strip (35). Shorted or damaged resistor (25). Open or defective resistor (23). Open or damaged capacitor (3-1), (3-2), or (3-3). Loose connections from any of these parts.

c. Tape Position—Tape Operating.—After the troubles indicated by symptoms (1) to (14) inclusive have been corrected, check operation at TAPE as follows: Satisfactory operation at KEY, no operation at TAPE limits the trouble to tubes 1, 2, and 3 and their associated mechanical and electrical parts. Make these tests only after it has been definitely assured that the photo-tube aperture, lens and mirror, controls, etc., are set according to the "OPERATING INSTRUCTIONS." The point-to-point resistance check should indicate all probable defects.

TAPE POSITION—TAPE OPERATING

Symptom	*Cause*
(15) No plate voltage tubes 2 & 3.	Shorted capacitor (4-1). Open resistor (39), (27), (26), or (40). Loose connection to tube socket.
(16) No keying with tape.	Open resistor (13-1) or (13-2). Resistor (13-1) or (13-2) shorted to shield ground. Loose connection to tube socket.

16. Point-to-Point d-c Voltages.—The tube socket pins from which the measurements shown in the following table are made are identified by numbers on the bottom of the sockets. The readings are taken with, (a) line voltage 115 volts, (b) both bias controls to extreme right, (c) volume control advanced one half of its total rotation, (d) main switch turned alternately from KEY to TAPE as noted, (e) photo cell adjustable cover in normal operating position without paper tape or other substance interrupting light beam and (f) nothing connected to OUTPUT terminals or KEY terminals. The location of the tubes from the bottom of the chassis is shown in Figure 5 where they are identified by the type and tube number. The following readings should be checked with a 20,000 ohm per volt meter only.

Tube No.	Type	Plate Pins	Plate Volts	Filament Pins	Filament Volts	Cathode Pins	Cathode Volts	Screen Pins	Screen Volts	Switch Position Tape	Switch Position Key
1	VT-252	4-GD	42	..	..	..	..	..	..	×	..
1	VT-252	4-GD	47	..	..	..	..	..	..	..	×
2	VT-116	8-5	0.64	2-7	5.0	5-GD	21	6-5	95	×	..
2	VT-116	8-5	0	2-7	5.0	5-GD	22	6-5	110	..	×
3	VT-116	8-5	60	2-7	6.2	5-GD	60	6-5	63	×	..
3	VT-116	8-5	2.4	2-7	6.2	5-GD	67	6-5	65	..	×
4	VT-96	8-3	88	2-7	6.2	8-1	120	..	..	×	..
4	VT-96	8-3	167	2-7	6.2	8-1	132	..	..	..	×
4	VT-96	8-6	80	2-7	6.2	8-1	120	..	..	×	..
4	VT-96	8-6	75	2-7	6.2	8-1	132	..	..	..	×
5	VT-96	8-3	145	2-7	6.2	8-1	3.6	..	..	×	..
5	VT-96	8-3	162	2-7	6.2	8-1	3.9	..	..	..	×
5	VT-96	8-6	150	2-7	6.2	8-1	3.6	..	..	×	..
5	VT-96	8-6	165	2-7	6.2	8-1	3.9	..	..	..	×
6	VT-115	8-3	370	2-7	6.2	8-1	21	8-4	255	×	..
6	VT-115	8-3	362	2-7	6.2	8-1	23	8-4	275	..	×
7	VT-115	8-3	370	2-7	6.2	8-1	21	8-4	255	×	..
7	VT-115	8-3	362	2-7	6.2	8-1	23	8-4	275	..	×
8	VT-244	Plate to Plate	750	2-8	5.0						
Exciter Lamp		..	..	..	6.3						

17. Point-to-Point Resistances. — *a. Resistance in Ohms from Socket Contacts to Ground.*—The tube socket pins from which the measurements shown in the following table are made, are identified by numbers appearing on the bottom of the sockets. The conditions for taking these measurements are that (a) the plug be disconnected from the power source, (b) both bias controls at extreme left, (c) the volume control be rotated to extreme right, (d) and the main switch at TAPE. The location of the tubes from the bottom of the chassis is shown in Figure 5 where they are identified by type and tube number.

		Tube Socket Pin							
No.	Type	1	2	3	4	5	6	7	8
1	VT-252	..	40,000,000	..	3,700	....	....	....	....
2	VT-116	0	3,700	1,200	40,000,000	1,200	7,700	3,700	280,000
3	VT-116	0	3,700	3,700	280,000	3,700	7,700	3,700	78,000
4	VT-96	0	3,700	70,000	78,000	8,200	72,000	3,700	8,200
5	VT-96	0	3,700	115,000	500,000	9,100	115,000	3,700	1,500
6	VT-115	0	3,700	22,000	18,000	300,000	Open	3,700	250
7	VT-115	0	3,700	22,000	18,000	300,000	22,000	3,700	250

b. Resistance from Resistor and Capacitor Mounting Card Terminals to Ground.—The terminals of the resistor and capacitor mounting card (38) from which measurements of resistance to ground are made, are identified by color coding (Figure 5). Resistance measurements from these terminals to ground are indicated below in the order in which the terminals appear when the bottom of the keyer is viewed with the front toward the observer. The conditions for taking these measurements are that (a) the plug be disconnected from the power source, (b) both bias controls be at extreme left, (c) the volume control be rotated to extreme right, and (d) the main switch at TAPE.

Wire Color Code	*Resistance to Ground in Ohms*	*Wire Color Code*	*Resistance to Ground in Ohms*
Black	0	Yellow	250
Green	300,000	....	110,000
Brown	9,100	....	0
Blue	115,000	Green	300,000
Red	115,000	Red	18,000
Yellow	1,500	....	0
Green	8,200	Blue	550,000
Blue	70,000	....	45,000
Brown	72,000	....	18,000
Red	78,000	....	480,000
Yellow	8,200	Green	7,800
Brown	3,700	Yellow	1,250
Green	280,000	....	3,700

CIRCUIT DIAGRAM KEYER TG-10-J (AUTOMATIC, 60 CYCLE) 110 VOLT A-C

APPARATUS LEGEND

REF. No.	PART NAME	QUAN.
1	27300 CAPACITOR .0005 MF.	(1)
2	27303 CAPACITOR .1 MF.	(2)
3	27301 & 2 CAP. .01 MF.	(3)
4	27304 CAP. 10-10-10 MF.	
5	27293 COIL 450 M H	
6	27294 CHOKE 6 H @ 80 MILS	
7	27323 FUSE	
8	27331 JACK	
9	27284 LAMP	
10	27335 KEY TERMINAL	
11	27334 POWER RECEPTACLE	
12	27717 RECEPTACLE	
13	27350 RES. 20 MEG. ½ WATT	(2)
14	27358 RES. 4.7 OHMS 1 WATT	
15	27351 RES. 270000 OHMS ½ WATT	(3)
16	27352 RES. 68000 OHMS ½ WATT	
17	27353 RES. 390000 OHMS ½ WATT	
18	27359 RES. 470 OHMS 1 WATT	
19	27354 RES. 27000 OHMS ½ WATT	(4)
20	27311 RES. 500000 OHMS	
21	27360 RES. 1500 OHMS 1 WATT	(2)
22*	27356 RES. 100000 OHMS 1 WATT	
23	27355 RES. 9100 OHMS ½ WATT	
24	27361 RES. 250 OHMS 10 WATT	
25	27362 RES. 100 OHMS 10 WATT	
26	27734 RES. 1000 OHMS 1 WATT	
27	27730 RES. 2500 OHMS 1 WATT	
28	27363 RES. 10000 OHMS 10 WATT	
29	27364 RES. 200 OHMS 10 WATT	
30	27365 RES. 4000 OHMS 10 WATT	
31	27732 SWITCH	(2)
32	27292 TRANSFORMER, FILAMENT	
33	27290 TRANSFORMER, POWER	
34	27291 TRANSFORMER, OUTPUT	
35	27336 OUTPUT TERMINAL	(2)
36	27748 RES. 250 OHMS ½ WATT	
39	27731 RES. 4000 OHMS 2 WATT	
40	27735 RES. 200 OHMS 1 WATT	
41	27592 MOTOR PLUG	
42	27511 MOTOR	
43	27590 MOTOR SWITCH	
44	27596 DIAL LIGHT	

* SC-TYPE No. RS-208

Figure 4. Keyer TG-10-J (Automatic, 60 Cycle), Circuit Diagram

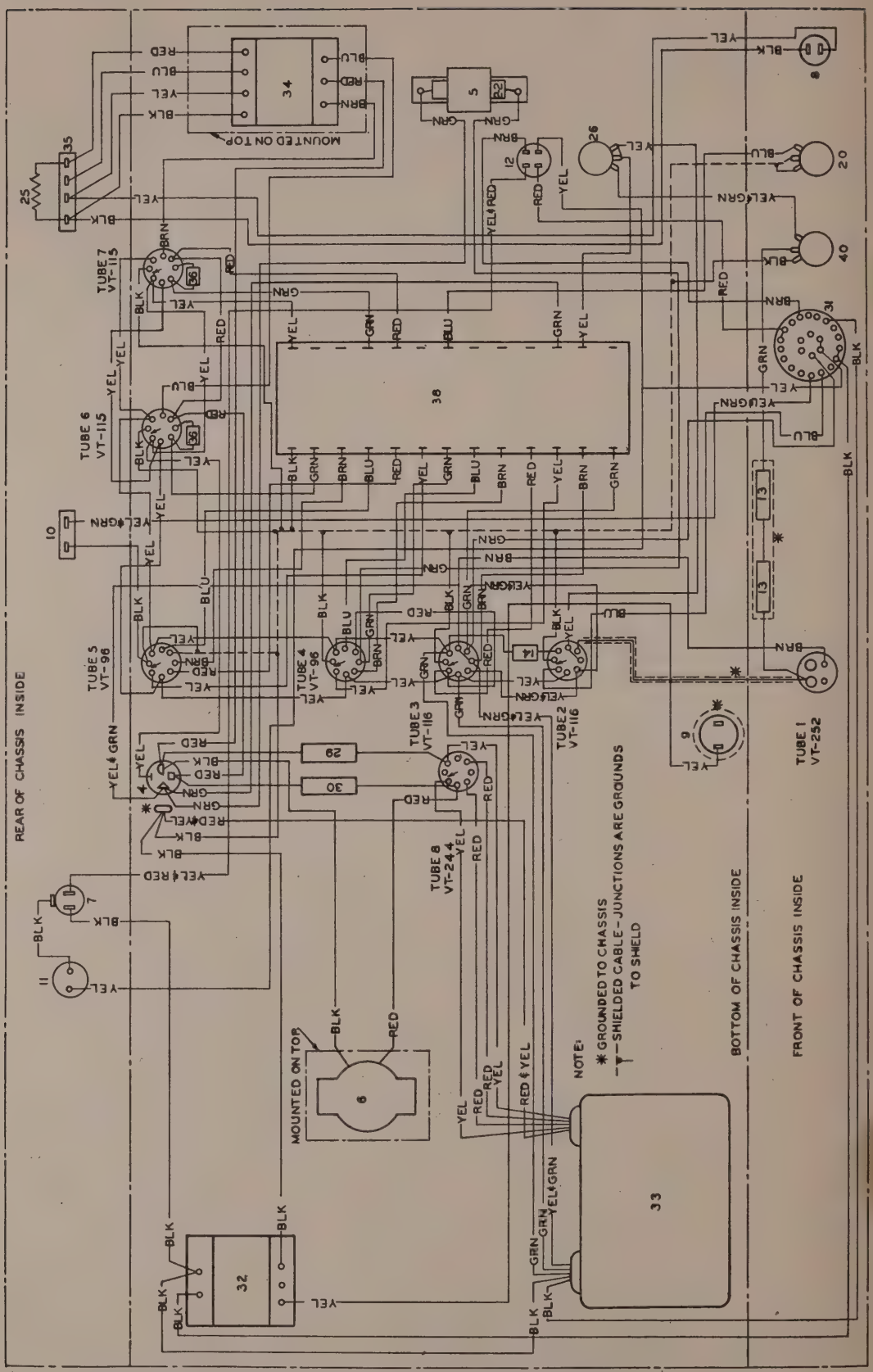

Figure 5. Keyer TG-10-J (Automatic, 60 Cycle), Wiring Diagram

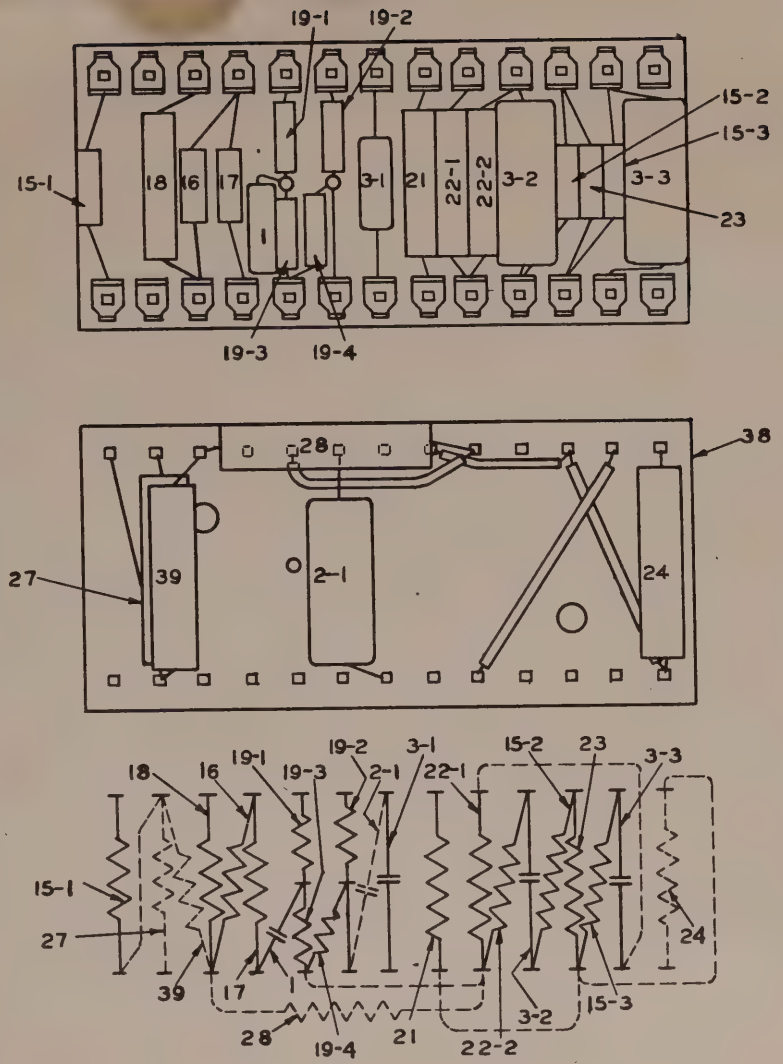

Figure 6. Keyer TG-10-J (Automatic, 60 Cycle), Schematic Diagram of Resistor and Capacitor Mounting Card

APPARATUS LEGEND

Ref. No.	*Part*	*Name*	*Quan.*
1	27300	Capacitor .0005 mf.	(1)
2	27303	Capacitor .1 mf.	(1)
3	27301 & 2	Capacitor .01 mf.	(3)
15	27351	Res. 270,000 ohms ½ watt	(3)
16	27352	Res. 68,000 ohms ½ watt	(1)
17	27353	Res. 390,000 ohms ½ watt	(1)
18	27359	Res. 470 ohms 1 watt	(1)
19	27354	Res. 27,000 ohms ½ watt	(4)
21	27360	Res. 1,500 ohms 1 watt	(1)
22*	27356	Res. 100,000 ohms 1 watt	(2)
23	27355	Res. 9,100 ohms ½ watt	(1)
24	27361	Res. 250 ohms 10 watts	(1)
27	27730	Res. 2,500 ohms 1 watt	(1)
28	27363	Res. 10,000 ohms 10 watts	(1)
38	27406	Res. and Capacitor Card Complete	(1)
39	27731	Res. 4,000 ohms 2 watts	(1)

* SC-Type RS—208.

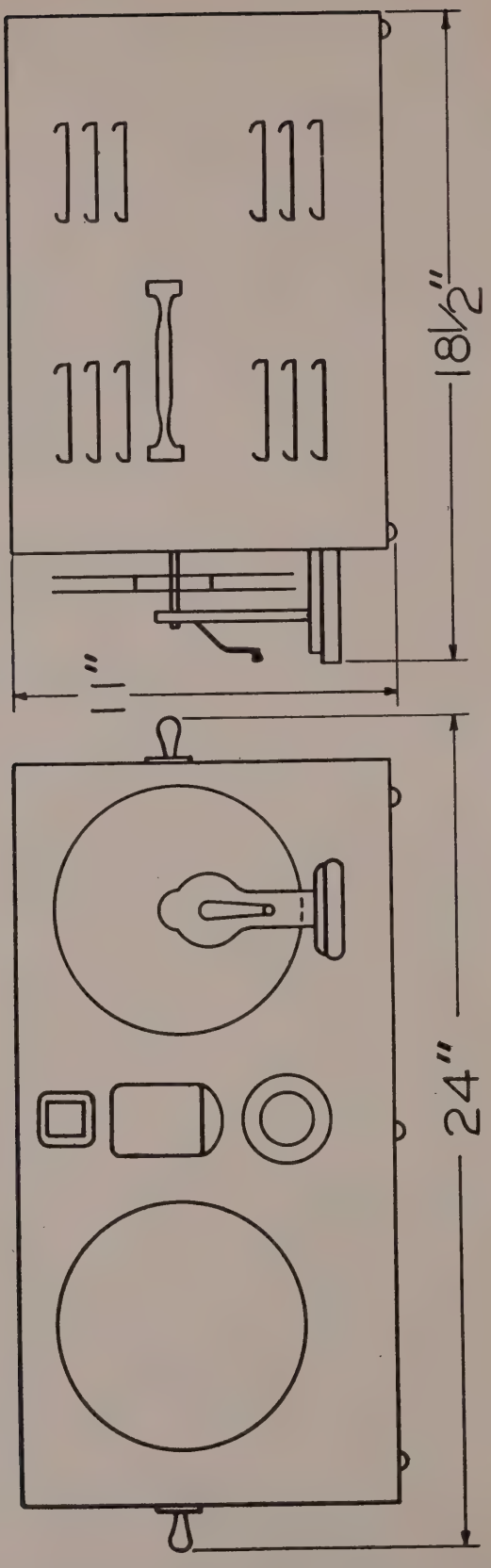

Figure 7. Keyer TG-10-(*) (Automatic, 60 Cycles) Outline Dimensions

Section V—Supplementary Data

CIRCUIT DIAGRAM KEYER TG-10-A (AUTOMATIC) 110 VOLT 25 CYCLE AC

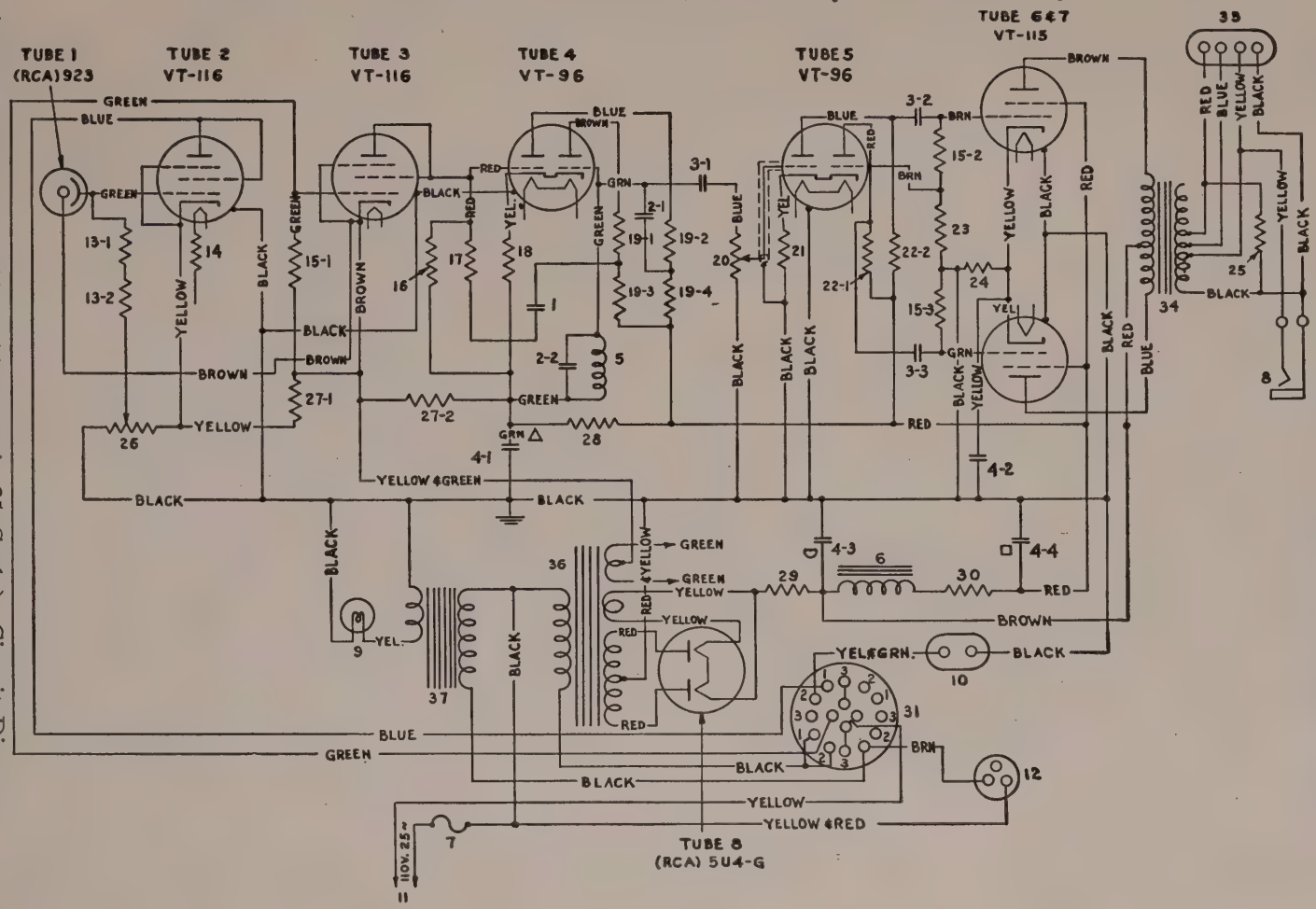

Figure 8. Keyer TG-10-A (Automatic 25 Cycle), Circuit Diagram

APPARATUS LEGEND

Ref. No.	Part	Name		Quan.
1	27300	COND.	.0005 MFD.	(1)
2	27303	COND.	.1 MFD.	(2)
3	27301 & 2	COND.	.01 MFD.	(3)
4	27304	COND.	10-10-10-10 MFD.	(1)
5	27293	COIL	450 M H	(1)
6	27294	CHOKE	6 H @ 80 Mils	(1)
7	27323	FUSE		(1)
8	27331	JACK		(1)
9	27234	LAMP		(1)
10	27335	KEY TERMINAL		(1)
11	27334	POWER RECEPTACLE		(1)
12	27332	RECEPTACLE		(1)
13	27350	RES.	20 MEG. ½ WATT	(2)
14	27358	RES.	4.7 OHMS 1 WATT	(1)
15	27351	RES.	270,000 OHMS ½ WATT	(3)
16	27352	RES.	68,000 OHMS ½ WATT	(1)
17	27353	RES.	390,000 OHMS ½ WATT	(1)
18	27359	RES.	470 OHMS 1 WATT	(1)
19	27354	RES.	27,000 OHMS ½ WATT	(4)
20	27311	RES.	500,000 OHMS	(1)
21	27360	RES.	1,500 OHMS 1 WATT	(1)
22*	27356	RES.	100,000 OHMS 1 WATT	(2)
23	27355	RES.	9,100 OHMS ½ WATT	(1)
24	27361	RES.	250 OHMS 10 WATT	(1)
25	27362	RES.	100 OHMS 10 WATT	(1)
26	27310	RES.	1,000 OHMS	(1)
27	27357	RES.	4,700 OHMS 2 WATT	(2)
28	27363	RES.	10,000 OHMS 10 WATT	(1)
29	27364	RES.	200 OHMS 10 WATT	(1)
30	27365	RES.	4,000 OHMS 10 WATT	(1)
31	27330	SWITCH		(1)
34	27291	TRANSFORMER,	OUTPUT	(1)
35	27336	OUTPUT	TERMINAL	(1)
36	27117	TRANSFORMER,	POWER	(1)
37	27116	TRANSFORMER,	FILAMENT	(1)

* SC-TYPE No. R S 208

CIRCUIT DIAGRAM KEYER TG-10-B (AUTOMATIC) 110 VOLT 60 CYCLE AC

APPARATUS LEGEND

Ref. No.	Part	Name	Quan.
1	27300	COND. .0005 MFD.	(1)
2	27303	COND. .1 MFD.	(2)
3	27301	& 2 COND. .01 MFD.	(3)
4	27304	COND. 10-10-10 MFD.	(1)
5	27293	COIL 450 M H	(1)
6	27294	CHOKE 6 H @ 80 Mils	(1)
7	27323	FUSE	(1)
8	27331	JACK	(1)
9	27234	LAMP	(1)
10	27335	KEY TERMINAL	(1)
11	27334	POWER RECEPTACLE	(1)
12	27332	RECEPTACLE	(1)
13	27350	RES. 20 MEG. ½ WATT	(2)
14	27358	RES. 4.7 OHMS 1 WATT	(1)
15	27351	RES. 270,000 OHMS ½ WATT	(3)
16	27352	RES. 68,000 OHMS ½ WATT	(1)
17	27353	RES. 390,000 OHMS ½ WATT	(1)
18	27359	RES. 470 OHMS 1 WATT	(1)
19	27354	RES. 27,000 OHMS ½ WATT	(4)
20	27311	RES. 500,000 OHMS	(1)
21	27360	RES. 1,500 OHMS 1 WATT	(1)
22*	27356	RES. 100,000 OHMS 1 WATT	(2)
23	27355	RES. 9,100 OHMS ½ WATT	(1)
24	27361	RES. 250 OHMS 10 WATT	(1)
25	27362	RES. 100 OHMS 10 WATT	(1)
26	27310	RES. 1,000 OHMS	(1)
27	27357	RES. 4,700 OHMS 2 WATT	(2)
28	27363	RES. 10,000 OHMS 10 WATT	(1)
29	27364	RES. 200 OHMS 10 WATT	(1)
30	27365	RES. 4,000 OHMS 10 WATT	(1)
31	27330	SWITCH	(1)
32	27292	TRANSFORMER, FILAMENT	(1)
33	27290	TRANSFORMER, POWER	(1)
34	27291	TRANSFORMER, OUTPUT	(1)
35	27336	OUTPUT TERMINAL	(1)

* SC-TYPE No. R S 208

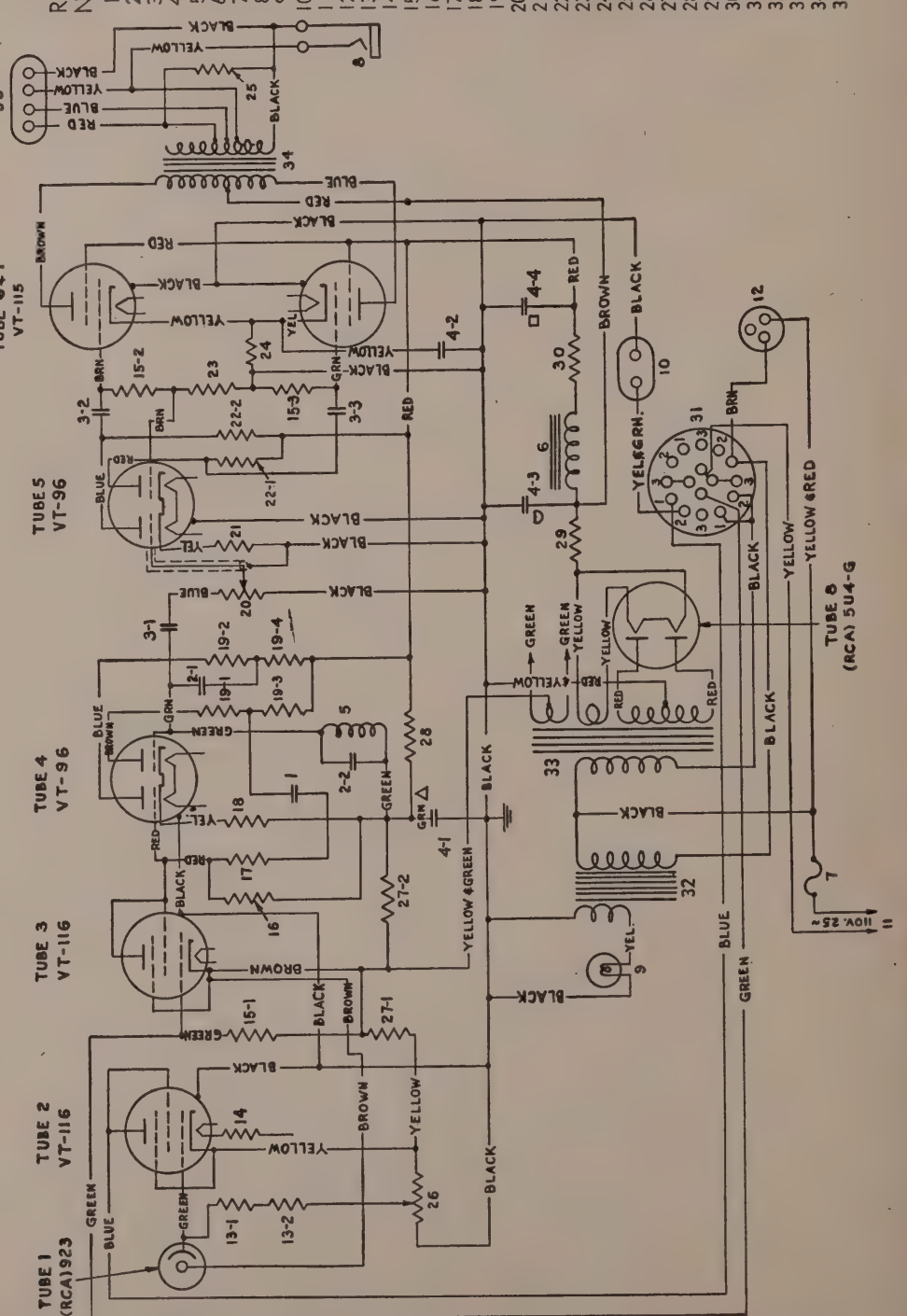

Figure 9. Keyer TG-10-B (Automatic 60 cycle) Circuit Diagram

CIRCUIT DIAGRAM KEYER TG-10-C (AUTOMATIC) 110 VOLT 60 CYCLE AC

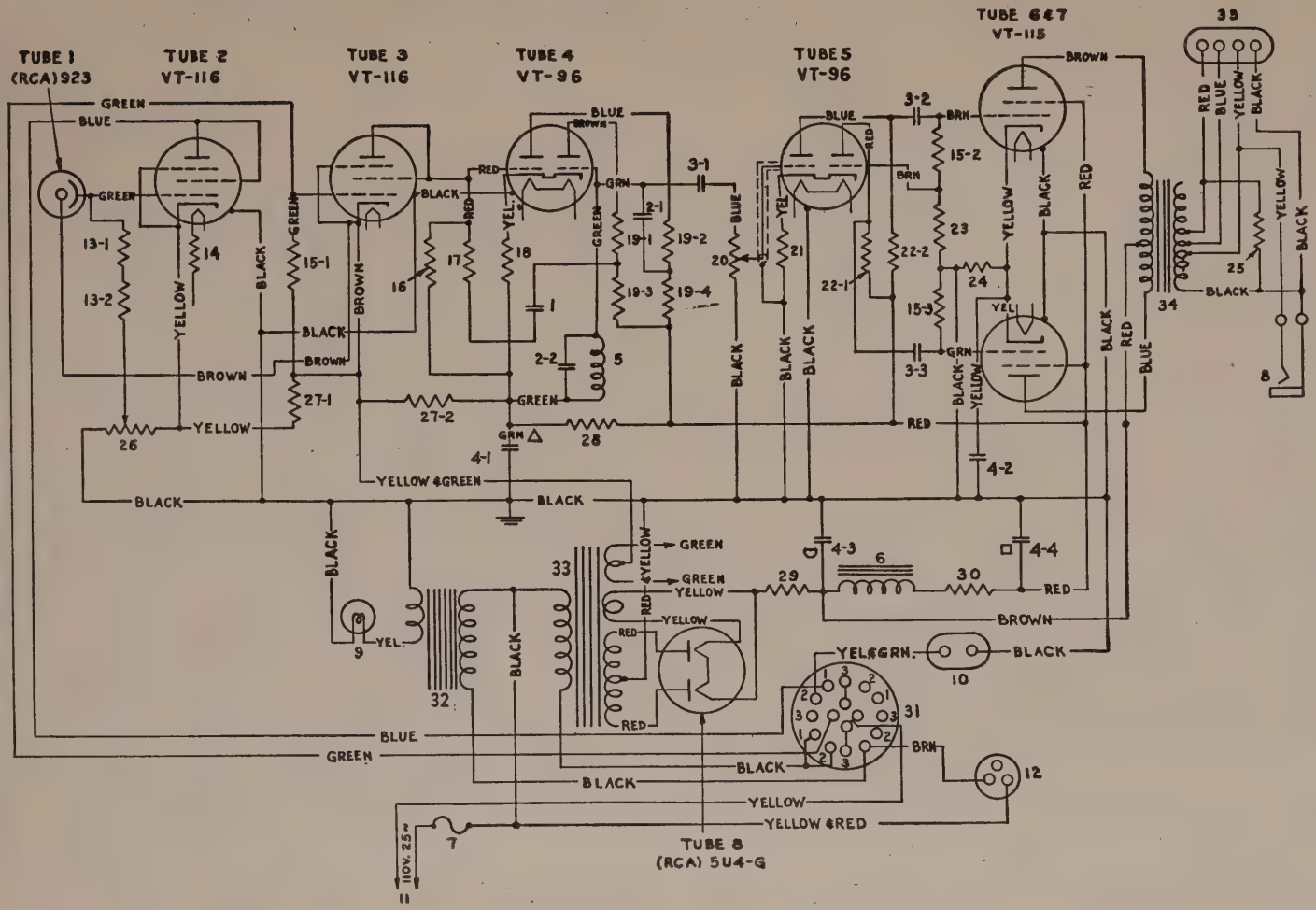

Figure 10. Keyer TG-10-C (Automatic 60 cycle) Circuit Diagram

APPARATUS LEGEND

Ref. No.	Part	Name		Quan.
1	27300	COND.	.0005 MFD.	(1)
2	27303	COND.	.1 MFD.	(2)
3	27301	& 2 COND.	.01 MFD.	(3)
4	27304	COND.	10-10-10-10 MFD.	(1)
5	27293	COIL	450 M H	(1)
6	27294	CHOKE	6 H @ 80 Mils	(1)
7	27323	FUSE		(1)
8	27331	JACK		(1)
9	27234	LAMP		(1)
10	27335	KEY TERMINAL		(1)
11	27334	POWER RECEPTACLE		(1)
12	27332	RECEPTACLE		(1)
13	27350	RES.	20 MEG. ½ WATT	(2)
14	27358	RES.	4.7 OHMS 1 WATT	(1)
15	27351	RES.	270,000 OHMS ½ WATT	(3)
16	27352	RES.	68,000 OHMS ½ WATT	(1)
17	27353	RES.	390,000 OHMS ½ WATT	(1)
18	27359	RES.	470 OHMS 1 WATT	(1)
19	27354	RES.	27,000 OHMS ½ WATT	(4)
20	27311	RES.	500,000 OHMS	(1)
21	27360	RES.	1,500 OHMS 1 WATT	(1)
22*	27356	RES.	100,000 OHMS 1 WATT	(2)
23	27355	RES.	9,100 OHMS ½ WATT	(1)
24	27361	RES.	250 OHMS 10 WATT	(1)
25	27362	RES.	100 OHMS 10 WATT	(1)
26	27310	RES.	1,000 OHMS	(1)
27	27357	RES.	4,700 OHMS 2 WATT	(2)
28	27363	RES.	10,000 OHMS 10 WATT	(1)
29	27364	RES.	200 OHMS 10 WATT	(1)
30	27365	RES.	4,000 OHMS 10 WATT	(1)
31	27330	SWITCH		(1)
32	27292	TRANSFORMER,	FILAMENT	(1)
33	27290	TRANSFORMER,	POWER	(1)
34	27291	TRANSFORMER,	OUTPUT	(1)
35	27336	OUTPUT TERMINAL		(1)

* SC-TYPE No. R S 208

CIRCUIT DIAGRAM KEYER TG-10-D (AUTOMATIC, 60 CYCLE) 110 VOLT AC

APPARATUS LEGEND

REF. No.	PART NAME	QUAN.
1	27300 CAPACITOR .0005 MF.	(1)
2	27303 CAPACITOR .1 MF.	(2)
3	27301 & 2 CAP. .01 MF.	(3)
4	27304 CAP. 10-10-10-10 MF.	
5	27293 COIL 450 M H	
6	27294 CHOKE 6 H @ 80 MILS	
7	27323 FUSE	
8	27331 JACK	
9	27284 LAMP	
10	27335 KEY TERMINAL	(2)
11	27334 POWER RECEPTACLE	
12	27717 RECEPTACLE	
13	27350 RES. 20 MEG. ½ WATT	(2)
14	27358 RES. 4.7 OHMS 1 WATT	
15	27351 RES. 270000 OHMS ½ WATT	(3)
16	27352 RES. 68000 OHMS ½ WATT	
17	27353 RES. 390000 OHMS ½ WATT	
18	27359 RES. 470 OHMS 1 WATT	(4)
19	27354 RES. 27000 OHMS ½ WATT	
20	27311 RES. 500000 OHMS	
21	27360 RES. 1500 OHMS 1 WATT	
22*	27356 RES. 100000 OHMS 1 WATT	(2)
23	27355 RES. 9100 OHMS ½ WATT	
24	27361 RES. 250 OHMS 10 WATT	
25	27362 RES. 100 OHMS 10 WATT	
26	27734 RES. 1000 OHMS	
27	27730 RES. 2500 OHMS 1 WATT	
28	27363 RES. 10000 OHMS 10 WATT	
29	27364 RES. 200 OHMS 10 WATT	
30	27365 RES. 4000 OHMS 10 WATT	
31	27732 SWITCH	
32	27292 TRANSFORMER, FILAMENT	
33	27290 TRANSFORMER, POWER	
34	27291 TRANSFORMER, OUTPUT	
35	27336 OUTPUT TERMINAL	
39	27731 RES. 4000 OHMS 2 WATT	
40	27735 RES. 200 OHMS 1 WATT	
41	27592 MOTOR PLUG	
42	27511 MOTOR	
43	27590 MOTOR SWITCH	
44	27596 DIAL LIGHT	

* SC-TYPE No. RS-208

Figure 11. Keyer TG-10-D (Automatic, 60 Cycle), Circuit Diagram

CIRCUIT DIAGRAM KEYER TG-10-F (AUTOMATIC, 60 CYCLE) 110 VOLT AC

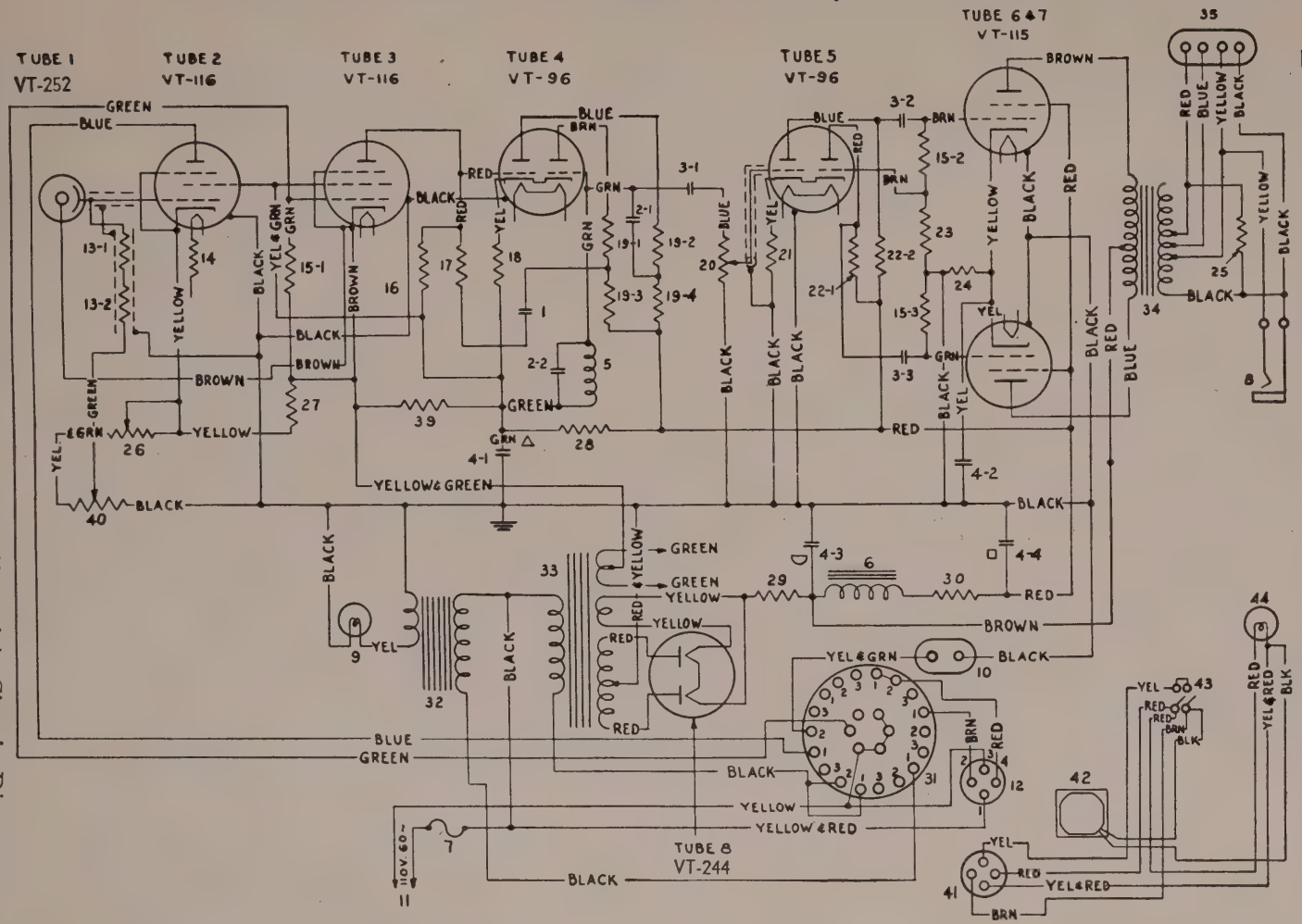

Figure 12. Keyer TG-10-F (Automatic, 60 cycle) Circuit Diagram

APPARATUS LEGEND

REF. NO.	PART	NAME	QUAN.
1	27300	CAPACITOR .0005 MF.	(1)
2	27303	CAPACITOR .1 MF.	(2)
3	27301 & 2	CAP. .01 MF.	(3)
4	27304	CAP. 10-10-10-10 MF.	(1)
5	27293	COIL 450 M H	(1)
6	27294	CHOKE 6 H @ 80 MILS	(1)
7	27323	FUSE	(1)
8	27331	JACK	(1)
9	27284	LAMP	(1)
10	27335	KEY TERMINAL	(1)
11	27334	POWER RECEPTACLE	(1)
12	27717	RECEPTACLE	(1)
13	27350	RES. 20 MEG. ½ WATT	(2)
14	27358	RES. 4.7 OHMS 1 WATT	(1)
15	27351	RES. 270000 OHMS ½ WATT	(3)
16	27352	RES. 68000 OHMS ½ WATT	(1)
17	27353	RES. 390000 OHMS ½ WATT	(1)
18	27359	RES. 470 OHMS 1 WATT	(1)
19	27354	RES. 27000 OHMS ½ WATT	(4)
20	27311	RES. 500000 OHMS	(1)
21	27360	RES. 1500 OHMS 1 WATT	(1)
22*	27356	RES. 100000 OHMS 1 WATT	(2)
23	27355	RES. 9100 OHMS ½ WATT	(1)
24	27361	RES. 250 OHMS 10 WATT	(1)
25	27362	RES. 100 OHMS 10 WATT	(1)
26	27734	RES. 1000 OHMS	(1)
27	27730	RES. 2500 OHMS 1 WATT	(1)
28	27363	RES. 10000 OHMS 10 WATT	(1)
29	27364	RES. 200 OHMS 10 WATT	(1)
30	27365	RES. 4000 OHMS 10 WATT	(1)
31	27732	SWITCH	(1)
32	27292	TRANSFORMER, FILAMENT	(1)
33	27290	TRANSFORMER, POWER	(1)
34	27291	TRANSFORMER, OUTPUT	(1)
35	27336	OUTPUT TERMINAL	(1)
39	27731	RES. 4000 OHMS 2 WATT	(1)
40	27735	RES. 200 OHMS 1 WATT	(1)
41	27592	MOTOR PLUG	(1)
42	27511	MOTOR	(1)
43	27590	MOTOR SWITCH	(1)
44	27596	DIAL LIGHT	(1)

* SC-TYPE No. RS-208

19. TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES)

(Reference numbers followed by an asterisk indicate that the part is supplied in the Maintenance Parts Group)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
1*	3D9500-74	1	Capacitor 0.0005 μf (±10%) 300 v; moulded mica, postage stamp type, ¾ in. x $\frac{7}{16}$ in. x $\frac{3}{16}$ in. Type 503-M	Osc. feed back	27300P	EM
2-1*	3DA100-128	1	Capacitor 0.1 μf (+40% —10%) 200 v; paper tubular $\frac{7}{16}$ in. diam. x 1½ in. long. Type 3-81N	Osc. feed back	27303P	SS
2-2*	3DA100-128	1	Capacitor 0.1 μf (+40% —10%) 200 v; paper tubular $\frac{7}{16}$ in. diam. x 1½ in. long. Type 3-81N	Osc. tank	27303P	SS
3-1*	3D281	1	Capacitor CA-281 0.01 μf (+40% —10%) 300 v; moulded paper postage stamp type; 1½ in. x ⅝ in. x ¼ in. Type 340	1st audio grid coupling	27301P	MR
3-2, 3*	3DA10-141	2	Capacitor 0.01 μf (+40% —10%) 600 v; paper tubular ⅜ in. diam. x 1¼ in. long. Type 3-81P	2nd audio grid coupling	27302P	SS

4-1, 2, 3, 4*	3DB10-24	1	Capacitor 10-10-10-10 μf (+40% —10%) 400 v; four section aluminum can; 1⅜ in. diam. x 2 in. high (Operating temperature 85° C.). Spec. Type FPQ-434	Filter	27304P	PM
5	3C2513	1	Coil 450 mh air core; 1¾ in. x 1½ in. x $1\frac{3}{32}$ in. Type A-395	Osc. tank	27293P	DE
6*	3C316-22	1	Coil 6 H at 80 ma, iron core; tropical treatment and special lead lengths. Type A-396	Filter choke	27294P	DE
7	3Z2603.2	1	Fuse 3 amp—250 v; ¼ in. diam. x 1½ in. long; glass tube type. Type #1043	Line	27323P	LI
8	2Z5599	1	Jack 2 contact, insulated, open circuit; 3½ in. long including extruded fiber washer #203; bakelite washer #212; brass washer #225; ⅜-32 nut #232. Type #1	Monitor	Jack #27311P Ext. Washer #27736P Bak. Washer #27737P Br. Washer #27738P Nut #27142P	CT

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
9	6Z6807	1	Lamp 6-8 v, 32-32 cp (2 filament), bayonet base; mazda. Type #1000	Photo-tube exciter	27284P	GE
10	3Z12522-50	1	Terminal 2 contact, fiber mounted, screw type 2 in. long x ¾ in. wide. Type #2-50	Key	27335P	HJ
11	2Z7138.1	1	Receptacle 2 pole flush (male); 1¼ in. diam. Type #61M10	A-C supply	27334P	AP
12	2Z8684	1	Receptacle 4 contact miniature polarized chassis mounting; ⅝ in. diam. Type #S4S	Motor	Recep. 27717P Ring 27718P	AP
3-1, 2,*	3Z6820	2	Resistor 20 megohms (±10%) ½ w; carbon; $\frac{3}{16}$ in. diam. x $\frac{9}{16}$ in. long. Type BT-½	Photo-tube load	27350P	IR
14*	3Z5994-4	1	Resistor 4.7 ohms (±10%) 1 w; wire wound; ½ in. diam. x 1¼ in. long. Special	Series filament, 1st d-c amplifier	27358P	GG

15-1*	3Z6727	1	Resistor 270,000 ohms (±10%) ½ w; carbon; 3/16 in. diam. x 9/16 in. long. Type BT-½	2nd d-c grid	27351P	IR
15-2, 3*	3Z6727	2	Resistor 270,000 ohms (±10%) ½ w; carbon; 3/16 in. diam. x 9/16 in. long. Type BT-½	2nd audio grid resistors	27351P	IR
16*	3Z6668	1	Resistor 68,000 ohms (±10%) ½ w; carbon; 3/16 in. diam. x 9/16 in. long. Type BT-½	2nd d-c plate load	27352P	IR
17*	3Z6739-1	1	Resistor 390,000 ohms (±10%) ½ w; carbon; 3/16 in. diam. x 9/16 in. long. Type BT-½	Osc. feed back	27353P	IR
18*	3Z6047-8	1	Resistor 470 ohms (±10%) 1 w; carbon; ¼ in. diam. x 1¼ in. long. Type BW-1	Cathode bias, osc.	27359P	IR
19-1, 2, 3, 4*	3Z6627-1	4	Resistor 27,000 ohms (±10%) ½ w; carbon; 3/16 in. diam. x 9/16 in. long. Type BT-½	Osc. plate load resistors	27354P	IR

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
20*	2Z7296-500M.2	1	Potentiometer 500,000 ohms taper C wire wound; with moisture seal and special shaft; 1¼ in. diam. Type 35	Volume control	27311P	CT
21*	3Z6150-35	1	Resistor 1,500 ohms (±10%) 1 w; wire wound; ¼ in. diam. x 1¼ in. long. Type BW-1	Cathode bias 1st audio	27360P	IR
22-1, 2*	3Z4608	2	Resistor RS-208 100,000 ohms (±10%) 1 w; carbon; ¼ in. diam. x 1¼ in. long. Type BT-1	Plate load 1st audio	27356P **SC-D-970	IR
23*	3Z6591	1	Resistor 9,100 ohms (±10%) ½ w; carbon; $\frac{3}{16}$ in. diam. x $\frac{9}{16}$ in. long. Type BT-½	Inverter grid 1st audio	27355P	IR
24*	3Z6025-20	1	Resistor 250 ohms (±5%) 10 w; wire wound; ⅜ in. diam. x 1¾ in. long; ceramic insulated. Type 10-K	Cathode bias 2nd audio	27361P	SS
25*	3Z6010-55	1	Resistor 100 ohms (±5%) 10 w; wire wound; ⅜ in. diam. x 1¾ in. long; ceramic insulated. Type 10-K	Output load	27362P	SS

** Indicates Signal Corps drawing

26*	2Z7296-IM.2	1	Potentiometer 1,000 ohms 2 w; lineal taper wire wound; with moisture seal and special shaft; 1¼ in. diam. Type 252	Photo-tube bias	27734P	CT
27*	3Z6250-2	1	Resistor 2,500 ohms (±10%) 1 w; wire wound; ¼ in. diam. x 1¼ in. long. Type BW-1	Voltage divider	27730P	IR
28*	3Z6610-72	1	Resistor 10,000 ohms (±5%) 10 w; wire wound; ⅜ in. diam. x 1¾ in. long; ceramic insulated. Type 10-K	Voltage divider	27363P	SS
29*	3Z6020-29	1	Resistor 200 ohms (±5%) 10 w; wire wound; ⅜ in. diam. x 1¾ in. long; ceramic insulated. Type 10-K	Voltage divider	27364P	SS
30*	3Z6400-23	1	Resistor 4,000 ohms (±5%) 10 w; wire wound; ⅜ in. diam. x 1¾ in. long; ceramic insulated. Type 10-K	Voltage divider	27365P	SS
31*	3Z9827.32	1	Switch 6 circuit, 3 contacts per circuit; shorting with special shaft length; 1 1/16 in. diam. of base. Type #3163J	Power and Selector	27732	PM

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
32*	2Z9717-1	1	Transformer, filament, 110 v. 60 cycle Pri. 115 v—47 va; sec. 6.3 v—6 amp; with tropical treatment. Type A-394	Exciter lamp filament	27292P	DE
33*	2Z9717-2	1	Transformer, power, 110 v. 60 cycles, 375-0-375 v—150 ma; 5 v—4 amp; 6.3 v —5 amp; tropical treatment and special leads. Type A-392	Power	27290P	DE
34*	2Z9632.25	1	Transformer, output Pri. 8,000 ohms C.T. sec. 0-4-8-15 ohms; tropical treatment and special leads. Type A-393	Output	27291P	DE
35	2Z9464.3	1	Terminal 4 contact fiber mounted; screw type 3 in. long x ¾ in. wide. Type #4-50	Output	27336P	HJ
36-1, 2*	3Z6025-3	2	Resistor 250 ohms (±10%) ½ w; carbon; $\frac{3}{16}$ in. diam. x $\frac{9}{16}$ in. long. Type BT-½	Output tubes Parasitic Oscillation Suppressor	27748P	IR

38	4A1200-2A/C7	1	Mounting Card Bakelite card including soldering lugs and mounting studs 1/16 in. x 1 3/8 in. x 5 in. Special	Resistor and capacitor mounting	27406S	GM
39*	3Z6400-3	1	Resistor 4,000 ohms (±10%) 2 w; 5/16 in. diam. x 1 11/16 in. long. Type BW-2	Voltage divider	27731P	IR
40*	2Z7287.2	1	Potentiometer 200 ohms 2 w; linear taper wire wound; with moisture seal and special shaft length; 1¼ in. diam. Type 252	Vernier bias	27735P	CT
41	2Z7234-6	1	Plug 4 contact, polarized shielded; miniature; ⅝ in. diam. Type #MPM4S	Motor connection	27592P	AP
42*	3H3000-3	1	Motor 115 v 60 cycle 0.65 amp shaded pole phonograph recording motor; GI type RX with special shaft. Special	Tape drive	27511P	GM

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
43*	3Z9858-5	1	Switch Double pole single throw toggle; $\frac{15}{32}$-32 threaded sleeve; hex and knurled mounting nuts furnished. Type 20902-GC	Motor	27590P	AH
44	2Z5886	1	Lamp 120 v 4 w; candelabra base; miniature bulb. Type #G-6	Dial light	27596P	HM
45	3Z3275.1	1	Fuse Post Black bakelite; 2⅛ in. long; ½ in. mounting hole; includes post, extractor nut and washer. Type #1075	Fuse mounting	Post 27322P Extractor 27746P Nut 27724P Washer 27747P	LI
46	4A1200-IF/R1	1	Resistor Assembly Includes two 20 meghom ½ w resistors; brass shield tube 2½ in. long; brass shield tube 1⅜ in. long; plastic insulating beads. Special	Photo-tube plate resistor assembly	27719S	GM

47	2Z9402.6	1	Terminal Bracket type lug strip. Type 5110 L.H.	Photo-tube resistor terminal	27639P	AR
48	6Z8358	1	Socket Metal flanged; double contact; bayonet type; with solder terminals. Type #12	Exciter lamp	27321P	FM
49-1	2Z8637	1	Socket 8 contact, retainer ring mounting, mica filled, for $\frac{1}{32}$ in. stock. Type #S8T	1st D-C amplifier tube	27318P	AP
49-2		7	Socket 8 contact, retainer ring mounting, black bakelite, for $\frac{1}{32}$ in. stock. Type S-8	Vacuum tubes	27724P	AP
50	2Z8659-4	1	Socket 4 contact, retainer ring mounting; Steatite. Type #SS4	Photo-tube	27320P	AP
51	2Z5988-16	1	Socket Candelabra type; insulated slotted bracket, bent down. Type #414L-CH	Dial lamp	27595P	DM
52	2Z9475.4	1	Mounting Strip $\frac{1}{8}$ in. x $\frac{3}{4}$ in. x $3\frac{3}{16}$ in. bakelite; includes soldering lugs. Special	Upper coil clamp, terminal.	27265	GM

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
53	2Z9475.4	1	Mounting Strip $\frac{1}{16}$ in. x $\frac{3}{4}$ in. x $2\frac{1}{16}$ in. bakelite. Special	Lower coil clamp	27266	GM
54	6Z7852	1	Retainer $1\frac{5}{16}$ in. OD x $\frac{3}{4}$ in. ID x $\frac{3}{32}$ in. steel washer; 2 tapped holes #6-32. Special	Exciter lamp socket	27716	GM
55	3DB10-24/1	1	Washer Steel metal special for capacitor type FPQ-434. Type #A-93424-1	Mounting can capacitor	27305	PM
56	4A1200-IF/H5	1	Housing Cast iron; $2\frac{7}{16}$ in. diam. at base. Special	Photo-tube	27705	GM
57	4A1200-IF/P6	1	Plate 2 in. x $2\frac{1}{2}$ in. x $\frac{1}{16}$ in. sheet steel. Special	Photo-tube socket mounting	27229	GM
58	4A1200-IF/S5	3	Spacer $\frac{5}{16}$ in. diam. x 1 in. brass; #6-32 tapped hole both ends. Special	Photo-tube plate	27237	GM

59	4A1200-IF/C16	1	Cover Drawn brass shell; 1⅜ in. diam.; includes clamping screw and nut. Special	Photo-tube aperture adjustment	27710S	GM
60*	4A1200A/222	2	Lens Moulded glass; 1.17 in. diam. Special	Optical system	27222P	GM
61	6L50130	2	Washer 1½ in. OD x 1 in. ID x $\frac{1}{32}$ in. thick steel. Special	Lens retainer	27223	GM
62	4A1200-IF/H6	1	Housing Moulded bakelite; 3 in. x 2 in. x 1¾ in. Special	Mirror housing	27581P	GM
63*	4A1200A/225	1	Mirror 1¾ in. x 1½ in. x ⅛ in. sheet glass silvered one side. Special	Optical system	27225P	GM
64	4A1200-IF/C5	1	Clamp ¼ in. wide x 0.016 in. thick formed strip phosphor-bronze. Special	Upper mirror clamp	27226	GM
65	4A1200-IF/C7	1	Clamp 1½ in. x $\frac{7}{16}$ in. x 0.016 in. phosphor-bronze. Special	Lower mirror clamp	27227	GM

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
66	4A1200-IF/G1	1	Gasket 3/8 in. x 2 1/8 in. x 1/8 in. sheet sponge rubber. Special	Dust seal, mirror housing	27625P	GM
67	4A1200-IF/S9	1	Spring 0.233 in. OD compression spring; 6 coils; 0.044 in. diam. music wire; 0.56 in. free length. Special	Adjustment; mirror housing	27577P	GM
68	4A1200-IF/B9	1	Bracket 1.50 in. x 0.50 in. x 0.25 in.; 1/16 in. formed sheet steel; includes elastic stop nut. Special	Adjustment; mirror housing	27575S	GM
69	4A1200-2A/B12	1	Bracket 3 1/2 in. x 2 1/2 in. x 3 3/32 in.; 3/32 in. sheet steel. Special	Motor mounting	27512	GM
70	4A1200-2A/B10	1	Bracket 2.33 in. x 1.62 in. x 0.62 in.; 3/32 sheet steel; includes pressed in bearings. Special	Cone mounting	27513S	GM

71	4A1200-2A/G2	1	Helical Gear 42 teeth, left hand helix, canvas base bakelite; steel hub. Special	Motor speed reducer	27514P	GM
72	4A1200-IF/C9	3	Collar Steel, ¼ in. ID ½ in. OD; 0.19 in. thick with #4-40 set screw hole. Special	Shaft retainer	27579	GM
73	4A1200-2A/R13	1	Rocker 3.22 in. x 2.75 in. x 1.00 in.; $\frac{3}{32}$ in. sheet steel; includes pressed in bearings. Special	Tape puller shaft	27520S	GM
74	4A1200-IF/C15	1	Cone Black bakelite moulded with steel inserts; 2¼ in. diam. large end; 90° angle of cone. Special	Variable speed drive	27515	GM
75	4A1200-2A/S6	1	Shaft ¼ in. diam. steel; 2.89 in. long. Special	Cone	27516	GM
76	4A1200-2A/S11	1	Sleeve ½ in. diam. x ¾ in. long; brass ¼ in. hole; assembled with key pin. Special	Hub, cone driven roller	27538S	GM
77*	4A1200D/527	1	Neoprene Ring Moulded; 1 in. ID; ¼ in. diam. cord. Special	Tire, cone driven roller	27527P	GM

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
78	4A1200-2A/S10	1	Shaft ¼ in. diam. steel; 5.09 in. long; includes ⅜ in. diam. steel sleeve. Special	Tape puller shaft	27537S	GM
79*	4A1200D/532	1	Roller Moulded, amber gum rubber 1 in. OD; ¼ in. hole; ½ in. thick. Special	Tape puller	27532P	GM
80	4A1200-IF/P10	1	Pulley $\frac{15}{16}$ in. diam. ¼ in. thick brass. Special	Take-up drive	27643	GM
81	4A1200-2A/S20	1	Bracket Cast iron; 1.84 in. long; includes rocker pivot shaft. Special	Rocker support	27137S	GM
82	4A1200-2A/S18	1	Spring ¼ in. OD; 0.032 in. music wire; 1.80 in. closed length. Special	Contact pressure variable speed drive	27536P	GM
83	4A1200-IF/B4	1	Bearing ½ in. diam. x $\frac{21}{64}$ in. long brass. Special	Pressure roller pivot bearing	27548	GM

84	4A1200-2A/A3	1	Arm 1¾ in. x ½ in. x $\frac{1}{16}$ in. sheet steel; includes arm shaft and pressure roller stud. Special	Pressure roller mounting	27540S	GM
85	4A1200-2A/R15	1	Roller ¾ in. diam. x 0.874 in. long brass. Special	Tape contact pressure	27546	GM
86	4A1200-2A/C8	1	Cam 1 in. diam. x $\frac{1}{16}$ in. sheet steel; assembled to hub. Special	Rocker lifting	27545S	GM
87	4A1200-2A/B9	1	Bracket 3.13 in. x 1.16 in. x 1.00 in.; $\frac{3}{32}$ sheet steel; includes indicator dial bearing. Special	Support, speed control mechanism	27550S	GM
88	6L7918-5-63	1	Feed Screw $\frac{5}{16}$ in. 18 thread; 3.95 in. long; steel. Special	Speed control	27553	GM
89	4A1200-IF/C12	2	Collar ⅜ in. OD; $\frac{3}{16}$ in. hole; 0.19 in. thick; steel; #4-40 set screw hole. Special	Retainer, feed screw and reel shaft	27622	GM

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
90	4A1200-IF/Y1	1	Yoke 1.31 in. x 0.88 in. x 0.62 in.; $\frac{1}{16}$ in. strip steel. Special	Retainer, cone driven roller	27556	GM
91	4A1200-IF/N3	1	Feed Nut $\frac{5}{16}$ in. 18 thread; $\frac{3}{4}$ in. square x $\frac{5}{8}$ in. thick brass. Special	Speed control	27555	GM
92	4A1200-IF/S3	1	Shaft $\frac{3}{16}$ in. diam. steel; 1.28 in. long; includes brass dial gear 32 pitch; 14 teeth $\frac{3}{16}$ in. face; Boston Gear Works #G-165. Special	Indicator dial shaft	27557S	GM
94	4A1200-IF/D3	1	Dial 1½ in. diam.; moulded plastic with steel inserts. Special	Tape speed indicator	27568P	GM
95	4A1200-IF/W5	1	Window 1.72 in. x 1.20 in. x 0.016 in. formed sheet steel; assembled to cellulose acetate window. Special	Dial window	27615S	GM

96	4A1200-IF/S4	1	Shaft $\frac{5}{16}$ in. square steel; 2.19 in. long includes reel retaining ball and $\frac{15}{16}$ in. diam. brass spring belt driven pulley. Special	Support, take-up reel	27570S	GM
97	4A1200-IF/B6	1	Bearing ½ in. diam. brass; ¾ in. long; $\frac{3}{16}$ in. hole. Special	Panel bearing; reel shaft	27572	GM
98*	4A1200D/573	1	Belt 0.11 in. diam. coil spring; 0.016 in. music wire; 11¾ in. closed length; no initial tension. Special	Take-up real drive	27573P	GM
99	4A1200-IF/R4	3	Rollar ⅝ in. diam. brass; ⅝ in. long. Special	Tape guide	27587P	GM
100	4A1200-IF/S10	3	Stud $\frac{8}{16}$ in. diam. steel; 1.198 in. long. Special	Guide roller stud	27586	GM
101	4A1200-IF/B11	1	Bracket 2.81 in. x 2.50 in. x 1.12 in.; ⅛ in. formed strip steel. Special	Rewind mounting	27212	GM
102	6Z5075	1	Hinge 2½ in. x 2½ in. x ⅛ in. steel butt hinge #850. Special	Rewind hinge	27211	GM

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Drawing No. Contractor's*	*Name of Manufacturer*
103*	4A1200A/209	1	Rewind Rewind assembly equivalent to #748 KM with special materials and finish. Special	Tape rewind	27209P	GM
104	4A1200-2A/S17	2	Spring 3/8 in. wide x 0.020 in. formed spring steel. Special	Rewind latch	27213P	GM
105*	2Z5838	2	Knob Black bakelite; pointer; 1/4 in. shaft. Type #S-292	Vernier bias control	27337P	KK
106*	2Z5822-7	1	Knob Black moulded bakelite; for 1/4 in. shaft; 3/4 in. diam. knurled rim. Type #1174	Speed control	27554P	IC
107		1	Name Plate 1 1/4 in. x 5/8 in. x 0.025 in. stainless steel; reversed etched; bright figures on black background. Type A	Motor switch ON-OFF	27591P	EE
108		1	Name Plate 6 5/8 in. x 3 5/8 in. x 0.025 in. stainless steel. Special	Control labels	27361P	GM

109		1	Name Plate 3½ in. x 1 in. x 0.020 in. steel. Special	Signal Corps name plate	27632P	GM
110	4A1200-2A/B6	1	Bracket 10 1/16 in. x 6½ in. x 13/16 in.; 1/16 in. formed sheet steel. Special	Amplifier bracket, right hand	27102-RH	GM
111	4A1200-2A/B6	1	Bracket 10 1/16 in. x 6½ in. x 13/16 in.; 1/16 in. formed sheet steel. Special	Amplifier bracket, left hand	27102-LH	GM
112	2Z1573.6	1	Cabinet 10½ in. x 21 in. x 13½ in. steel cabinet similar to (PP) Cat. #DL-128 with special mounting holes and without trim. Special	Keyer cabinet	27601P	GM
113	2Z1573.6/1	1	Latch Cabinet latch as furnished on Par-Metal cabinet DL-128 except steel parts, parkerized and wax dipped; brass parts nickel plated. Special	Cabinet latch	27604P	GM

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
114	6Z5016	2	Handle Formed steel 5 in. long; No. 1; finish applied by contractor. Type #482	Cabinet handle	27603	SW
115	2Z4310	6	Foot 1 in. diam. moulded rubber. Type #698	Cabinet foot	27606P	AI
116	2Z1573.5	1	Cabinet Assembly Cabinet with hardware assembled. Special	Keyer cabinet	27600S	GM
117	2Z2490	1	Chassis Spot welded sheet steel box 17 in. x 10 in. x 3 in. Special	Amplifier	27702S	GM
118	2Z2490.1	1	Cover 9⅞ in. x 16⅞ in. x 0.036 in. sheet steel includes circuit label plate. Special	Bottom cover, chassis	27739S	GM
119	2Z6960.3	1	Panel 8¾ in. x 19 in. x ⅛ in. sheet steel. Special	Mounting mechanical parts	27506	GM

120	2Z6960.4	1	Panel Assembly Complete front panel assembly including amplifier mounting brackets. Special	Mechanical unit	27505S	GM
121	4A1200-IF/A1	1	Amplifier Amplifier unit assembled complete. Special	Signal source	27700S	GM
122	4A1200-IF/A3	1	Amplifier and panel assembly operating unit complete less tubes, bottom cover, cabinet, mounting hardware and power cord; suitable for relay rack mounting. Special	Unmounted keyer	27750S	GM
123*	8A3240	2	Reel 16 mm 400 ft. capacity film reel; sheet steel black enamel finish. Type "Standard"	Tape	27190	KM
124*	3E3590	1	Cord 2 Conductor, rubber covered; 2 pole male plug one end; 2 pole female plug other end; 8 ft. long. Special	A-C power line	27610P	GM
125	2T96	2	Tube VT-96 Class B twin triode metal; vacuum. Type 6N7	Oscillator and 1st audio tubes	27280P	RC

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
126	2T115	2	Tube VT-115 Beam power amplifier metal; vacuum. Type 6L6	Push-pull output	27281P	RC
127	2T116	2	Tube VT-116 Triple grid detector amplifier; metal; vacuum. Type 6SJ7	1st and 2nd d-c amplifier tubes	27282P	RC
128	2T244	1	Tube VT-244 Full wave high vacuum rectifier; glass. Type 5U4G	Rectifier tube	27283P	RC
129	2T252	1	Tube VT-252 Photo-tube Type #923	Photo-tube	27285P	RC
130	4A1200-IF/T3		Tube Set 2-VT-96 2-VT-115 2-VT-116 1-VT-244 Packed in shipping carton	Tube complement for keyer	27752P	RC

131	4A1200-IF	1	Keyer TG-10-J Complete keyer packed in carton; including power cord, exciter lamp and photo tube but excluding other vacuum tubes and reels.	Keyer	27500S	GM
132	6L7032-8.8S.PH	7	Screw #10-32 x ½ in. Phillips binding head; steel; parkerized.	Brackets and chassis to panel	27314P	AS
133	6L7032-8.3S.PH	3	Screw #10-32 x ½ in. Phillips fillister head; steel; parkerized.	Rewind bracket to panel	27317P	AS
134	6L7032-8.2S.PH	6	Screw #10-32 x ½ in. Phillips oval head; steel; parkerized.	Panel to cabinet	27316P	AS
135	6L7032-6.8S.PH	13	Screw #10-32 x ⅜ in. Phillips binding head; steel; parkerized.	Bracket to chassis; chassis to cabinet; feet to cabinet	27315P	AS
136	6L6832-8.3S.PH	1	Screw #8-32 x ½ in. Phillips fillister head; steel; parkerized.	Motor to bracket	27524P	AS
137	6L6832-6.8S.PH	13	Screw #8-32 x ⅜ in. Phillips binding head; steel; parkerized.	Handles to cabinet; motor bracket to panel; motor to bracket	27645P	AS

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
138	6L6832-5S.PH	3	Screw #8-32 x 5/16 in. Phillips flat head; steel; parkerized.	Roller studs to panel	27628P	AS
139	6L6832-4-8S.PH	3	Screw #8-32 x 1/4 in. Phillips binding head; steel; parkerized.	Rollers to studs	27627P	AS
140	6L6832-4.3S.PH	1	Screw #8-32 x 1/4 in. Phillips fillister head; steel; parkerized.	Cone bracket to motor bracket	27535P	AS
141	6L6632-16.8S.PH	3	Screw #6-32 x 1 in. Phillips binding head; steel; parkerized.	Coil to chassis; mirror housing and adjustment	27250P	AS
142	6L6632-12.2S.PH	1	Screw #6-32 x 3/4 in. Phillips oval head; steel; parkerized.	Mirror housing to panel	27626P	AS
143	6L6632-10.2S.PH	3	Screw #6-32 x 5/8 in. Phillips oval head; steel; parkerized.	Rewind to bracket	27248P	AS
144	6L6632-8.8S.PH	20	Screw #6-32 x 1/2 in. Phillips binding head; steel; parkerized.	Parts to chassis; feed nut adjustment; rocker support to panel	27254P	AS

145	6L6632-8.4.PH	3	Screw #6-32 x ½ in. Phillips fillister head; brass; nickel plated.	Capacitor to chassis; lug strip to chassis	27255P	AS
146	6L6632-4.8S.PH	7	Screw #6-32 x ¼ in. Phillips binding head; steel; parkerized.	Resistor and capacitor card to chassis; speed control bracket to panel; spacers to phototube plate	27624P	AS
147	6L6632-4.4.PH	2	Screw #6-32 x ¼ in. Phillips fillister head; brass; nickel plated.	Ring to chassis	142100P	AS
148	6L6632-3.8S.PH	2	Screw #6-32 x 3/16 in. Phillips binding head; steel; parkerized.	Yoke to feed nut	27623P	AS
149	4A1200-IF/S16	2	Screw #6-32 x ⅛ in. Headless set; hexagon socket type; steel; parkerized; cup point.	Helical gear; cone	27567P	DS
150	6L6440-5.8S.PH	2	Screw #4-40 x 5/16 in. Phillips binding head; steel; parkerized.	Latch spring to rewind bracket	27393P	AS

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
152	4A1200-IF/S11	8	Screw #4-40 x 1/8 in. Headless set; hexagon socket type; steel; parkerized; cup point.	Retaining collars (5) cam, take-up drive pulley	142380P	DS
153	6L7949	4	Screw #8 x 1/4 in. self-tapping; Phillips binding head; parkerized. Type Z	Bottom plate to chassis	27387P	PK
154	6L6632-3.8S.PH	1	Screw #6-32 x 3/16 in. self-tapping; Phillips binding head; parkerized. Type F	Pilot lamp bracket to panel	27637P	PK
155	6L6440-3.8S	5	Screw #4-40 x 3/16 in. self-tapping; binding head; parkerized. Type F	Clamps to mirror housing; mirror adjusting bracket to panel	27636P	PK
156	6L7948	4	Screw #4 x 3/16 in. drive; round head; nickel plated. Type U	Name plates to panel	27383P	PK
157	6L7942	6	Screw #2 x 3/16 in. self-tapping; round head; parkerized. Type Z	Lens washers to panel	27384P	PK

158	6L7946	8	Screw #2 x $\frac{3}{16}$ in. drive; round head; nickel plated. Type U	Dial window to panel; dial to support	27385P	PK
159	6L3610-32S.P	21	Nut #10-32 hexagon steel; parkerized; American standard.	Transformer to chassis; chassis to cabinet; parts to panel; panel to chassis; brackets to chassis	27346P	AS
160	6L3108-32S.P	8	Nut #8-32 hexagon; steel; parkerized; American standard.	Handles to cabinet	27574P	AS
161	6L3106-32S.P	27	Nut #6-32 hexagon; steel; parkerized; American standard.	Parts to chassis; parts to rewind bracket; parts to panel; indicator dial to shaft	27347P	AS
162	6L3106-32.1	4	Nut #6-32 hexagon; brass; nickel plated; American standard.	Capacitor and lug strip to chassis	51222P	AS

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
163	6L3104-40S.P	2	Nut #4-40 hexagon; steel; parkerized; American standard.	Latch springs to rewind bracket	27348P	AS
164	4A1200-IF/N5	1	Nut #10-32 hexagon cap; brass; black nickel plated.	Puller retainer	27345P	CS
165	6L3106-32.40	1	Nut #6-32 knurled; brass; black nickel plated.	Photo cover clamp	27349P	FS
166	6L3506-32S	3	Nut 3/8 in. 32 x 3/32 in. thick steel; parkerized; 1/2 in. across flats.	Cone driven roller and panel bearings	27644P	US
167	6L3106-32.1S	1	Nut #6-32 cap nut; 5/8 in. long; 5/16 in. hexagon; steel. Special	Pressure roller retainer	27549	GM
168	6L3505.18S	2	Nut 5/16 in. 18 thread 1/8 in. thick; 1/2 in. hexagon; steel. Special	Feed screw stop nut	27621	GM

169	6L72220	5	Washer Lock; for 3/8 in. screw; internal teeth; steel; parkerized. Type #1220	Controls to chassis; cone driven roller	27415P	SI
170	6L72210	17	Washer Lock; for #10 screw internal teeth; steel; parkerized. Type #1210	Chassis to cabinet; panel and bracket to chassis; rewind bracket to panel	27366P	SI
171	6L72206	25	Washer Lock; for #6 screw internal teeth; steel; parkerized. Type #1206	Parts to chassis; parts to rewind bracket; rocker bracket to panel; feed nut assembly	27647P	SI
172	6L72806	3	Washer Lock; for #6 screw; internal teeth; phosphor bronze; no finish. Type #1906	Capacitor and lug strip to chassis	27367P	SI
173	6L72204	2	Washer Lock; for #4 screw; internal teeth; steel; parkerized. Type #1204	Latch spring to rewind bracket	27368P	SI
174	6L73010	21	Washer Lock; #10 x 3/32 in. x 3/64 in. S.A.E. standard steel; parkerized.	Chassis to cabinet; brackets to panel and chassis; rewind bracket to panel; transformer to chassis	27377P	GG

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
175	6L73008	14	Washer Lock; #8 x 5/64 in. x 3/64 in. S.A.E. standard steel; parkerized.	Handles to cabinet; bracket to motor; motor bracket to panel	27523P	GG
176	6L73006	34	Washer Lock; #6 x 5/64 in. x 3/64 in. S.A.E. standard steel; parkerized.	Parts to chassis; spacers to photo plate; parts to panel; indicator dial to shaft	27378P	GG
177	6L73004	2	Washer Lock; #4 x 5/64 in. x 1/32 in. S.A.E. standard steel; parkerized.	Latch springs to rewind bracket	27379P	GG
178	6L52016	2	Washer 1 3/8 in. OD x 3/8 in. ID x 3/32 in. thick steel. Special	Spacer, cone driven roller	27528P	GM
179	6L52015	2	Washer 1 9/16 in. OD x 3/8 in. ID x 1/16 in. thick steel. Special	Flange, cone driven roller	27529P	GM

180	6L52018	2	Washer $\frac{15}{16}$ in. OD x $\frac{1}{4}$ in. ID x $\frac{1}{16}$ in. thick steel. Special	Flange, tape puller roller	27533P	GM
181	6L50511	3	Washer 0.190 ID x $\frac{1}{2}$ in. OD x $\frac{3}{32}$ in. thick steel; parkerized.	Space rocker from panel	27308	GM
182	6L50008	6	Washer #8 S.A.E. standard brass; black nickel plated.	Space motor from bracket	27588P	LB
183	6L50006S	5	Washer #6 x $\frac{3}{32}$ in. thick steel; parkerized; S.A.E. standard except thickness.	Pilot bracket mounting; spacer; rewind hinge; retainers; mirror housing adjustment	27638P	GG
184	6L50010S	6	Washer #10 hollow counter-sunk steel; parkerized.	Panel to cabinet	27296P	LB
185	3Z12059-4	1	Terminal #8 locking type; formed steel; parkerized. Type #2104	Anchor, variable speed pressure spring	27326P	SI

TABLE OF REPLACEABLE PARTS FOR KEYER TG-10-J (AUTOMATIC, 60 CYCLES) (Cont'd)

Reference No.	*Signal Corps Stock No.*	*Qty.*	*Name of Part and Description*	*Function*	*Contractor's Drawing No.*	*Name of Manufacturer*
186	3Z12059-5	3	Terminal #6 locking phosphor bronze; tinned. Type #2106	Power receptacle; grounding capacitor; grounding exciter lamp	27325P	SI
187	4A1200-2A/P5	2	Pin 1/8 in. x 1/2 in. Groovpin; parkerized. Type #4	Rewind hinge stop	27342P	GP
188	4A1200-2A/P3	2	Pin 3/32 in. x 3/8 in. Groovpin; parkerized. Type #2	Stop for pressure roller arm	27340P	GP
189	4A1200-2A/P8	1	Pin 3/32 in. x 1/4 in. Groovpin; parkerized. Type #2	Key for cone driven roller	27522P	GP
190	4A1200-2A/P6	1	Pin 1/16 in. x 3/8 in. Groovpin; parkerized. Type #5	Shaft to rocker; support bracket	27343P	GP

192		4	Shakeproof Washer Internal teeth Type 11 #1106-1	Filament trans. to chassis	27749P	SI
193		1	Terminal Bracket Type Lug Strip Special	Rectifier resistors support terminal	27743P	AR
194*	6R15600	0	Screw Driver Phillips Type 2A	Service tool	27398P	AS

20. LIST OF MANUFACTURERS

Abbreviation	*Name*	*Street Address*	*City*	*State*
AH	Arrow-Hart & Hegeman Elec. Co.	103 Hawthorne St.	Hartford	Connecticut
AI	Atlantic India Rubber Works, Inc.	1453 West Van Buren St.	Chicago	Illinois
AP	American Phenolic Corp.	1830 South 54th Ave.	Chicago	Illinois
AR	American Radio Hardware Co., Inc.	476 Broadway	New York	New York
AS	American Screw Co.		Providence	Rhode Island
CS	Corbin Screw Co.		New Britain	Connecticut
CT	Chicago Telephone Supply		Elkhart	Indiana
DE	Dongan Electric Mfg. Co.	2987 Franklin St.	Detroit	Michigan
DM	Drake Mfg. Co.	1713 West Hubbard St.	Chicago	Illinois
DS	Danly Machine Specialties	47-28—37th St.	Long Island City	New York
EE	Eastern Etching & Mfg. Co.	Grape St.	Chicopee	Massachusetts
EM	Electro Motive Mfg. Co.		Willimantic	Connecticut
FM	Frank W. Morse Co.	301 Congress St.	Boston	Massachusetts
FS	Fischer Special Mfg. Co.	Morgan & Dower Sts.	Cincinnati	Ohio
GE	General Electric Co.	Nela Park	Cleveland	Ohio
GG	George K. Garrett	1421 Chestnut St.	Philadelphia	Pennsylvania
GI	General Industries		Elyria	Ohio
GM	Gray Manufacturing Co.	16-30 Arbor St.	Hartford	Connecticut
GP	Groove Pin Corp.	411 Kerrigan Ave.	Union City	New Jersey
HJ	Howard B. Jones	2300 Wabansia Ave.	Chicago	Illinois
HM	Herzog Miniature Lamp Works, Inc.		Long Island City	New York
IC	Insuline Corp. of America	36-02—35th Ave.	Long Island City	New York
IR	International Resistance Co.	401 North Broad St.	Philadelphia	Pennsylvania

Abbreviation	*Name*	*Street Address*	*City*	*State*
KK	Kurz-Kasch Co.	1415 South Broadway	Dayton	Ohio
KM	Keystone Mfg. Co.	151 Hallet St.	Boston	Massachusetts
LB	L. J. Barwood Mfg. Co.		Everett	Massachusetts
LI	Littelfuse Inc.	4765 Ravenswood Ave.	Chicago	Illinois
MR	Micamold Radio Corp.	1007 Flushing Ave.	Brooklyn	New York
PK	Parker-Kalon Corp.	200 Varick St.	New York	New York
PP	Par-Metal Products Corp.	32-62—49th St.	Long Island City	New York
PM	P. R. Mallory Co.		Indianapolis	Indiana
RC	R.C.A. Mfg. Co.		Harrison	New Jersey
SI	Shakeproof Inc.	2501 North Keeler Ave.	Chicago	Illinois
SS	Sprague Specialties Co.		North Adams	Massachusetts
SW	Stanley Works		New Britain	Connecticut
US	United Screw & Bolt Co.	2513 W. Cullerton St.	Chicago	Illinois

[A.G. 062.11 (5-13-43)]

By Order of the Secretary of War:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:
J. A. ULIO,
Major General,
The Adjutant General.

DISTRIBUTION:
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(For explanation of symbols see FM 21-6)